South Western Railway

Performance Review

Coledale Consulting Ltd/Atkins Global

Authored by: Michael Holden, Doug Thompson and Jan Glasscock August 2018

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Authors' note

This report addresses the remit devised by officials at the Department for Transport working on behalf of the Secretary of State for Transport, and which is set out in Appendix A. It contains our own assessment of the causes of performance decline over the last eight years and a series of recommended actions designed to reverse this. It also assesses the position regarding the proposed timetable expansion for December 2018.

The three of us have worked collaboratively on this project. We have drawn on performance analysis conducted for us by [redacted] of Network Rail Wessex, and we would like to acknowledge his expertise in manipulating data to meet our requests.

During the review we have met with many directors, managers and individual members of staff employed by both SWR and Network Rail Wessex, most of whose contributions we have anonymised. We would like to place on record our thanks to each and every one of them for the time and knowledge they freely shared with us.

However, the conclusions drawn, and suggestions made for potential change in the future, are ours and ours alone. Any errors of interpretation are also ours alone.

Contents

1. Executive summary and table of recommendations

1.1 Work packages 1 and 2 – operational performance

Operational performance has been in long term decline since a peak in January 2011 during which time the timetable and train mileage run have been broadly static. The two biggest principal causes of this decline over eight years are considered to be:

A loss of timetable resilience caused by the following:

- Increasing passenger loadings over time putting dwell times under pressure
- A progressive increase in the impact of defensive driving behaviour
- Shortage of fully trained drivers combining with operational complexity of train crew diagrams leading to lack of resourcing resilience and heavy dependence on free day working
- Serious loss of operational expertise and command and control capability in Control function before and after the move to Basingstoke
- Increase in various train lengths over time from 8 to 10 and 12 cars, meaning that junctions take longer to clear and trains approach platform ends slower
- Insufficient focus on prevention and removal of Temporary and Emergency Speed Restrictions on the network

Degradation in service recovery capability during and after disruption due to:

- Loss of capability to control train crew during disruption due to physical separation of resource management from operational control coupled with complexity of train crew diagrams
- Significant shortfall in compliance with the driver and guard route and traction knowledge matrix, especially at Waterloo Depot and for Class 707 traction
- inadequate knowledge of key diversionary routes/depots amongst traincrew

In addition, a number of other factors have come together and acted to worsen operational performance:

1. A **significant increase in the impact of infrastructure failures** over time
2. **Ageing infrastructure assets being more intensively used,** and with insufficient proactive maintenance and renewals activity, over a sustained period of time

3. **Managerial distraction and uncertainty** over a prolonged period of time
4. A **decline in adequacy and effectiveness of performance management** over time

Since August 2017 some other factors have caused further deterioration in operability or management of the network:

5. **Loss of flexibility and lower capability of track and signalling at Waterloo** installed during the South West Capacity Upgrade in 2017
6. **Introduction of 10 car working on Suburban routes** without commensurate infrastructure upgrades required for perturbation
7. **Insufficient stabling facilities** since the introduction of the Class 707 fleet
8. A **prolonged and ongoing industrial dispute** causing diversion of managerial effort and loss of cooperation amongst some members of train crew.
9. **Misalignment of incentives between SWR[1] and NR[2]**
10. A **loss of effectiveness of management of alliance-based activities** caused by inadequate reinforcement of alliancing behaviours

Unless corrective action is taken it seems likely that underlying performance, as measured by PPM, may continue to deteriorate over the coming months. However, there are also a number of opportunities for performance to improve over the coming months and years without further corrective action being initiated. These include

- beneficial impact of a homogenous suburban fleet (due to be introduced over the next two years)
- implementation of driver control of doors (DCO) on the new Class 701 units when introduced
- implementation of ABDO on the Class 701 fleet.

[1] South Western Railway, trading name of the franchisee which took over the South Western franchise in August 2017

[2] Network Rail. In this report this means either the organisation as a whole, or the Wessex Route, depending on the context

This report makes a series of recommendations to address the problem areas identified above. These fall into three categories: short term (this year), medium term (next year) and long term (2020 and beyond).

1.2 Work package 3 – December 2018 timetable

On 9th July 2018, whilst this review was underway, it was announced by the Rail Delivery Group (RDG) that the December 2018 timetable would not after all contain the proposed enhancements as bid by SWR, as a consequence of the wider timetabling problems experienced across the industry for the May 2018 timetable, but would instead be a roll-over of the existing May 2018 timetable. We consider the comments and conclusions we have made below, in respect of implementing the changes originally intended for December 2018, to be valid regardless of when they subsequently occur.

Proposals for the December 2018 timetable change were already being amended during the course of this review period (before the intervention by RDG). A reduced package of service enhancements was eventually bid by SWR to NR on the required date in accordance with normal industry processes[3].

From a timetabling and infrastructure perspective the proposals as bid to NR are considered by us to be acceptable so long as:

- the four remaining platforms at Waterloo International Terminal are reopened (and staffed) as planned before the timetable change date
- Gauging issues with the 442 fleet are resolved in time to start crew training in earnest
- Additional sidings are completed and made available at Woking (or elsewhere) before the timetable change date
- NR's train planning team confirms that it has sufficient capacity to re-plan the Waterloo station platform workings to allow the WIT capacity to be exploited.

[3] A wider package of changes designed to meet the obligations laid out in the franchise agreement has been postponed until a later date.

From an operational perspective the position is very tight but achievable. SWR is recruiting and training drivers as fast as possible. Diagrammed workload increased in December 2017 and will increase further in December 2018 if these changes are implemented. There is still a route and traction learning backlog, and this is particularly pronounced at Waterloo depot. SWR considers it will just have sufficient productive driving resource available in time to operate the timetable as originally bid in December 2018. It should be noted however, that this assumes a continued high level of rest day working by drivers, which depends on a positive relationship with drivers' representatives continuing.

We conclude the following:

- Implementing the revised timetable proposals in December 2018 would have been likely to cause a further slight deterioration in the level of performance resilience, but this would probably have been manageable if the short-term recommendations from this report were progressed in a timely manner.
- Now that many of the proposed service enhancements have been postponed until May 2019 or beyond, further work is required to determine the extent to which these are deliverable in a way consistent with infrastructure capability, resilient infrastructure maintenance, and productive train crew availability. In addition, further work is needed, including a robust performance assessment, to determine if the network as a system is capable of coping with the level of increased services proposed.
- Regardless of decisions taken on additional peak and off-peak services, we consider that it would be seriously detrimental to the ability to maintain the infrastructure to the required high standard, for trains to start earlier and finish later, as currently proposed. Reasons for this are set out in Sections 8 and 9.

1.3 Recommendations

We have split these into six topic-based categories and show them below.

For each recommendation we have indicated how long we consider it should take to implement, with the following suggested timelines:

SHORT TERM	By the end of 2018
MEDIUM TERM	By the end of 2019
LONG TERM	2020 onwards

We have also attempted to provide an indication of relative importance, in order to assist prioritisation:

TOP PRIORITY	HIGH PRIORITY	MEDIUM PRIORITY
7 recommendations	9 recommendations	12 recommendations

Performance management

No.	Recommendation	Term	Prioritisation
1	NR should review its delay attribution policies (including those related to small-minutes and the attribution of unexplained delay) and the resources it makes available to effectively attribute delays. The aim should be for all delays and incidents to be investigated and explained (Section 3.9)	MEDIUM	HIGH
5	SWR and NR should work together to overhaul and dramatically improve performance management planning, reporting, analysis, and forecasting (section 5.1)	SHORT	TOP
6	SWR and NR should overhaul the current ineffective performance management meeting structure (section 5.1)	SHORT	TOP
7	SWR and NR should review their combined capability and capacity for performance analysis and management and further strengthen it if appropriate (section 5.2.1)	SHORT	HIGH
8	NR should review its visualisation practice as applied within Wessex Route to focus on critical aspects of delivery and to use time more effectively (section 5.2.2)	SHORT	MEDIUM
9	NR RMD and SWR MD should overtly support a relaunch of the SWR performance management system led by the new Performance and Planning Director (section 5.2.3)	SHORT	TOP

Contracts and relationships

No.	Recommendation	Term	Prioritisation
2	DfT should reconsider re-baselining the franchise performance regime to allow some relief from the deterioration seen between bid submission and franchise start date (section 4.2)	MEDIUM	MEDIUM

3	DfT should consider how it could instigate steps to create a better alignment of performance incentives between SWR and NR for CP6. (section 4.2)	MEDIUM	HIGH
4	SWR and NR should review the operation of the existing alliancing arrangements with a view to either reinforcing them or easing them as best suits both parties. (section 4.3)	MEDIUM	HIGH

Train Operations

No.	Recommendation	Term	Prioritisation
10	SWR should review the provision and location of CCTV monitors on station platforms to assist guards with dispatching trains (section 6.1)	MEDIUM	MEDIUM
11	SWR should consider standardising the riding position of guards for each length of train formation at stations between Raynes Park/Barnes and Waterloo (section 6.1)	SHORT	MEDIUM
12	SWR should seek to achieve the maximum extent of DCO possible on its routes (section 6.1)	LONG	HIGH
14	SWR should consider amending the professional driving policy such that drivers understand the need to draw up appropriately when approaching key signals in the throat outside Waterloo station when they are displaying red aspects (section 6.2)	SHORT	MEDIUM
20	SWR to consider reinstating the shunter capability at Staines sidings on both day shifts, and some stock should be planned to be berthed there between the peaks to leave some siding space free in Clapham Yard for use in perturbation (section 6.8)	SHORT	MEDIUM
28	SWR should undertake a systematic route and branch review of Route & Traction Variation with the aim of reducing the complexity that arises from the principle of 'Variation with Diagram' and move towards adopting 'Variation by Roster'. This should be undertaken with due regard to the plans developed to create new driver depots as part of the Franchise Delivery Plan (section 10.2.2)	MEDIUM	MEDIUM

Infrastructure changes

No.	Recommendation	Term	Prioritisation
13	NR should consider the provision of closing up signals both the Up and Down Main Slow line platforms at Wimbledon, Earlsfield, Clapham Junction and Vauxhall (section 6.1)	LONG	MEDIUM
15	NR should carry out a feasibility study into increasing the Permanent Speed Restriction on the Main Suburban lines into and out of the station, and into and out of Platforms 20 to 24, from 15mph to 20mph (section 6.6.1)	MEDIUM	TOP
16	NR should seek derogation or other technical solution to resolve the sub-standard overlap problems affecting routeing into and out of Platforms 20 to 24 (section 6.6.2)	MEDIUM	HIGH
17	SWR and NR should carry out a joint operability review ahead of Class 701 operation to identify any infrastructure changes that would be beneficial to performance before their introduction. This would also assist with improving the operability of the existing 10-car railway (section 6.7)	SHORT	MEDIUM
18	NR should include the movement of the crossover at Kingston to permit extension of its bay platform to 10 cars in the core scope of the Feltham Area Resignalling project making a longer term significant operability improvement (section 6.7)	LONG	MEDIUM
19	NR should consider motorising and remotely controlling the ground frame controlled trailing crossover between Raynes Park and Motspur Park and creating a signalled route to turnback from the Up Branch platform at Raynes Park (section 6.7)	LONG	MEDIUM
22	Network Rail should consider developing a package of infrastructure enhancement schemes designed primarily to improve the core resilience of the existing timetable structure (section 6.11)	LONG	MEDIUM

Infrastructure maintenance and renewals

No.	Recommendation	Term	Prioritisation
21	NR should set itself a challenging target to remove all the existing long standing ESRs and unplanned TSRs, and create much tighter 'remediate and remove' targets for all those which are imposed when required (section 6.10)	SHORT	TOP

25	NR should seek to provide sufficient incremental financial resource for maintenance and renewals during CP6 to at least arrest the decline in asset age profiles (section 8.3)	LONG	TOP
26	NR, SWR and DfT should cooperate so as to produce longer no-trains periods (5 nights per week) in the suburban area (as identified in the report) to facilitate much improved infrastructure maintenance access. This involves adjustment being made to the Train Service Specification (section 9.1.3)	LONG	HIGH
27	NR should expedite implementation of phase 2 of the safer isolations programme in the suburban area and introduce cyclical maintenance practices to optimise the efficiency of access and work activities (section 9.1.3)	LONG	HIGH

Control and resourcing

No.	Recommendation	Term	Prioritisation
23	SWR and NR should fully review the White Pages and Disruption Contingency Plans to reflect current operational circumstances (section 7.4)	SHORT	HIGH
24	SWR and NR should develop a package of measures for the control and resourcing organisation which will include, but is not limited to: 1. The creation of service management pods [redacted] containing Train Service Management, train crew and rolling stock resource management, customer service control and information capability 2. [redacted] 3. Implementation of a senior on-shift SWR manager within the ROC to effectively represent SWR's interests in decision making 4. Improved training and competence assessment for SWR controllers 5. Review the arrangement of desks within the ROC to maximise the opportunity for "controllers ear" to work effectively	MEDIUM	TOP

	6. Introducing improved decision support tools as set out in the Committed Obligation 7. Alignment of the revised control structure with any proposed changes to driver depots to better align resources and resource control (section 7.6)		

2. Structure of this Report

In Section 3 we analyse the key performance data over the last eight year period in order to assess the main reasons for the deterioration. It is necessary to understand what has caused the decline in order to identify what now needs to be changed to arrest the decline and then produce an improvement.

In Section 4 we consider the organisational and wider industry issues which have affected the performance of this network over this period of time.

In Section 5 we consider performance management processes and capability, both in policy and in practice.

In Section 6 we address the extent to which the core resilience of the existing timetable structure has been eroded over time. This analysis includes discussion on train crew diagramming practices and route/traction knowledge issues.

In Section 7 we assess the ability of the Control and Resourcing structures in place to manage disruption and achieve service recovery after disruption. This includes response capability on the ground as well as the resource situated within the Control and Resourcing structures themselves.

In Section 8 we consider NR's infrastructure performance in more detail and place it in the context of the regulatory framework for maintenance and renewals.

In Section 9 we assess the potential for changes to overnight train services and the possession and isolation regime for core infrastructure maintenance.

In Section 10 we consider the contribution made by operations and fleet within the franchisee's control.

In a separate set of annexes (not contained within this high-level report) we have provided details of the more in-depth analysis we have undertaken which supports our main conclusions and recommendations.

Committed Obligations

We have included in appropriate places in the main body of this report details of committed obligations on SWR in its franchise agreement that are relevant to the subject under discussion. These are shown in shaded text boxes and are for information only, to aid clarity regarding the context the franchisee finds itself in.

3. Historical data analysis

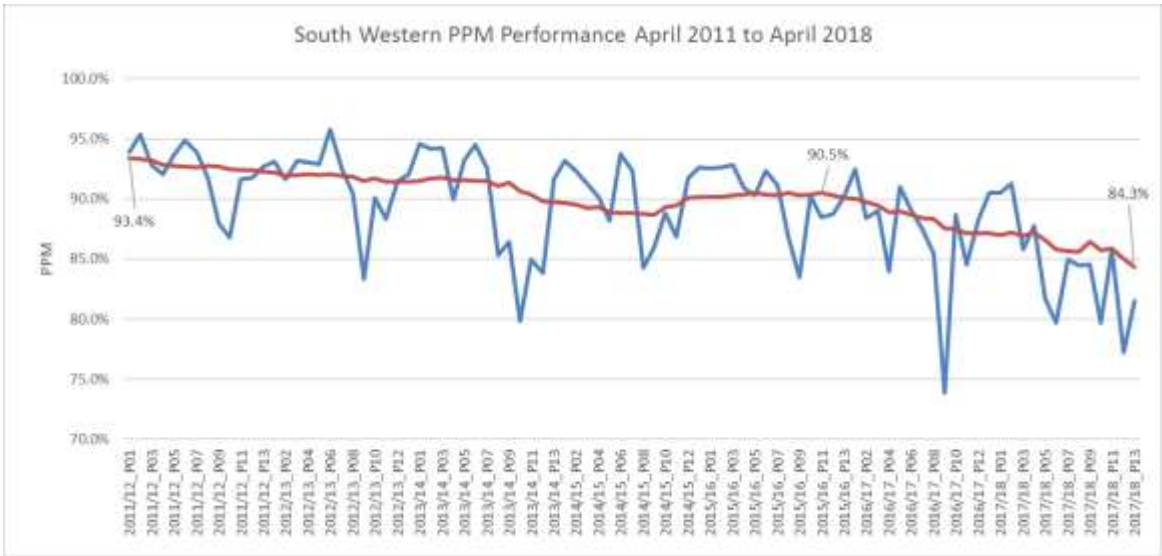
This section is a review of historical SWT[4]/SWR performance data. To the greatest extent possible data has been obtained covering the period from the start of the 2009/10 financial year to the end of the 2017/18 financial year, this being the period over which the long-term degradation in performance has occurred. The analysis reviews high level Right Time (RT) and Public Performance Measure (PPM) data, as well as incident count and delay minutes for selected categories, and also utilises additional data sets where useful. The purpose of the review is to identify trends in the data to assist us in understanding the main causes of the fall in performance, to inform our discussions with those involved, and to identify useful recommendations to assist in arresting the fall in performance and facilitate a recovery towards franchise and NR objectives.

3.1 Headline PPM since 2010

The existing timetable structure for what is now SWR dates from a major restructuring implemented in May 2004. The number of trains run has remained broadly static since then until the present time. Subsequent to the introduction of this timetable structure PPM improved for a number of years before peaking at a Moving Annual Average (MAA) of 93.9% in October 2009. In January 2011 it stood at 93.9%, since when there has been a long term decline. At the end of the 2017/18 financial year the PPM MAA had declined to 84.3%, a drop of 9.1% since the end of the 2010/11 financial year. This compares with a national reduction of 3.0% to 87.8% over the same timeframe. The most recent high

[4] South West Trains, trading name of the former franchisee which operated the South Western franchise until August 2017

point was 90.5% in early 2016 since when the rate of decline has been faster than at any point in the last seven years. In the first five periods of 2017/18 the MAA has dropped by a further 1% to 83.3%.



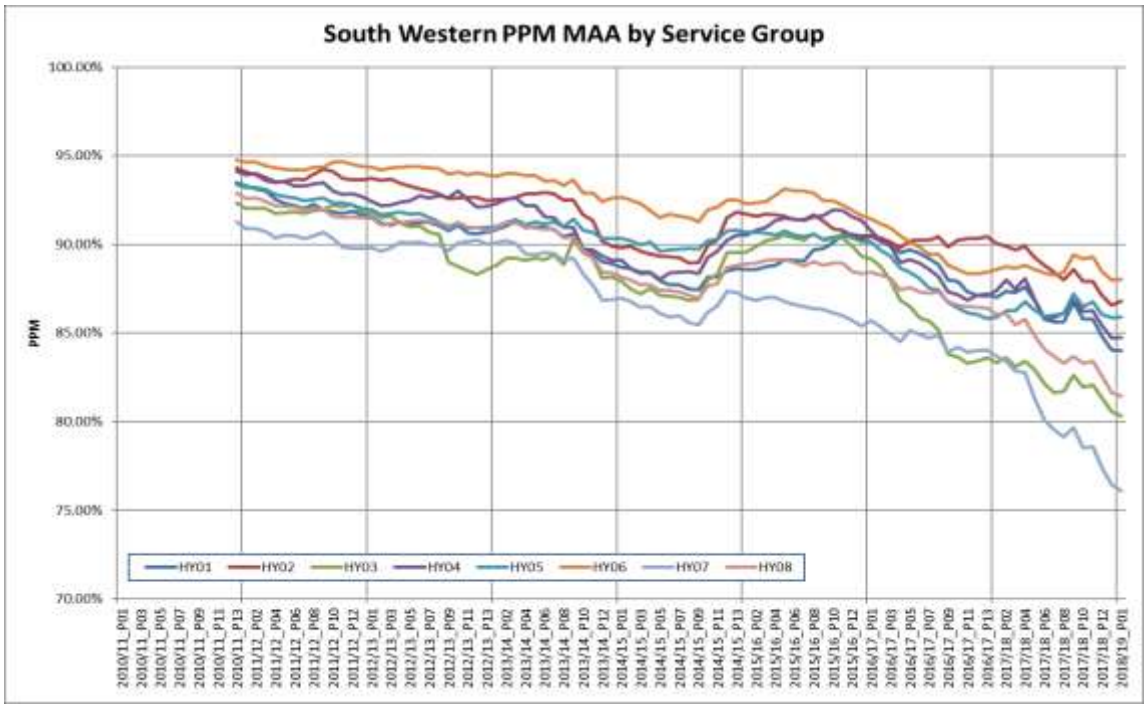
3.2 PPM breakdown

The PPM results can be broken down to Service Group Level. There are eight service groups into which SWR services are divided, based upon lines of route/significant flows. The service groups and the approximate percentage of the total daily service that they make up are:

Service group	Name	Description	% of SX service
HY01	Main Suburban	Local services to Shepperton, Chessington, Guildford etc	31%
HY02	South Hants Local	Regional services around Southampton	4%
HY03	West of England	Salisbury, Exeter and Bristol Temple Meads	5%
HY04	Farnham/Alton	Farnham/Alton services	4.5%
HY05	Windsor Inners	Kingston and Hounslow loops, Windsor, Weybridge	18%
HY06	Windsor Outers	Ascot, Frimley, Reading	10%
HY07	Portsmouth	Portsmouth via Haslemere	8%
HY08	Weymouth	Basingstoke, Southampton, Bournemouth, Weymouth	19.5%

Analysis of the MAA trends shows that at the start of the 2011/12 financial year all service groups were performing within a range of 91% to 95% PPM (a 4% range). By the end of the 2017/18 financial year the range had widened to 76% to 88% (a 12% range), the best performing having fallen by 7% and the worst by 15%. All service groups are now

performing at less than 90% PPM MAA, a situation that has existed since summer 2016.



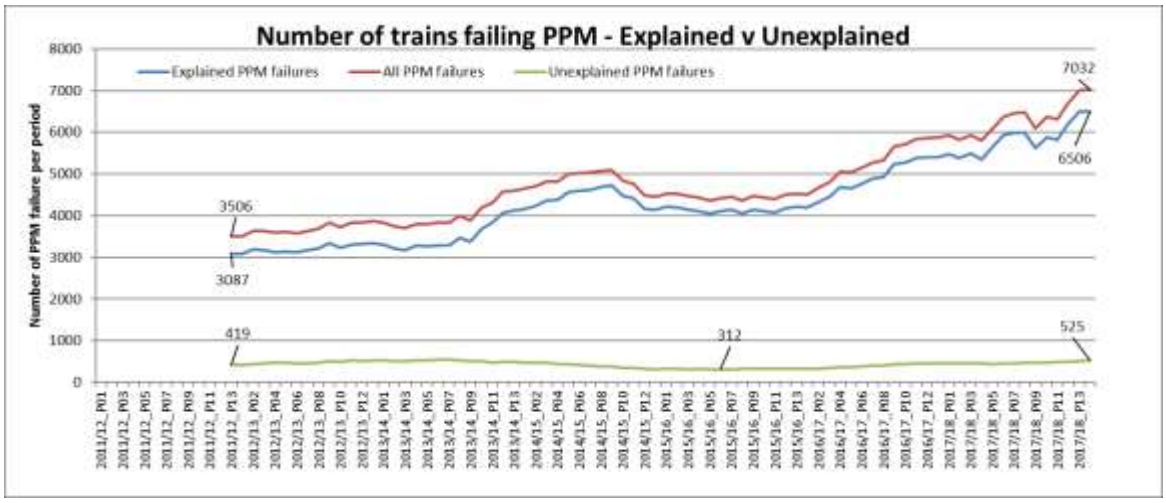
The worst performing service groups cover the long-distance journeys: HY08 Waterloo-Weymouth, HY03 Waterloo to West of England and HY07 Waterloo to Portsmouth. These service groups (accounting for around 32% of total SWR train services) are also those which have seen the most rapid decline in performance over the last two years.

The best performing service groups, all of which are performing at more than 85% MAA and cover relatively short journey distances, are: HY06 Windsor Outers, HY02 South Hampshire Locals, and HY05 Windsor Inners. These service groups also account for 32% of the total SWR train services.

The single largest service group, HY01 Main Suburban, which accounts for almost a third of all trains operated by South Western is sitting at around 84% PPM having fallen 10% over the eight year period. Given the size of this service group, its performance is the single most dominant factor in the achievement of PPM outcomes.

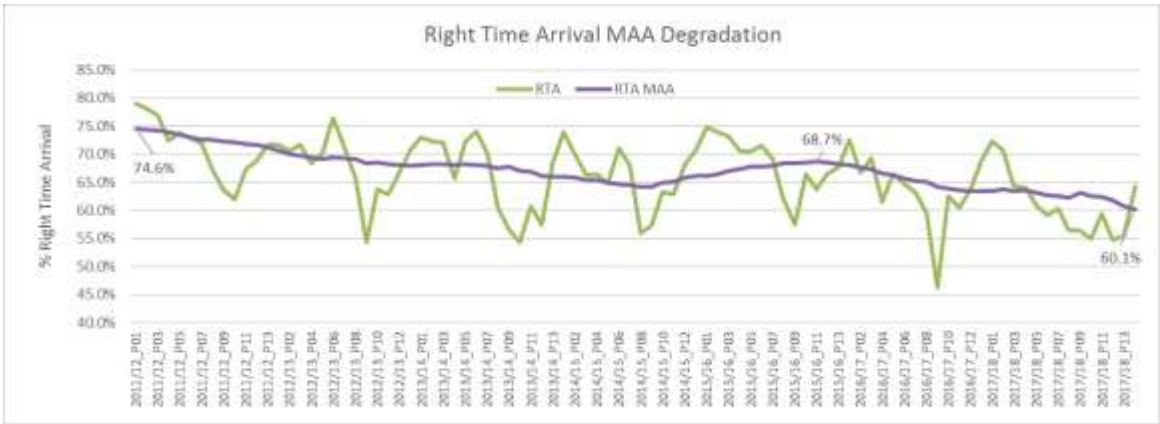
We sought to test the extent to which the deterioration in PPM might be a result of very low level perturbation or congestion which could go undetected within the data, due to Delay Attribution rules; the possibility being that there had been a significant increase in

the number of trains failing PPM (being delayed by 5 minutes) without any cause being attributed. As can be seen, whilst there has been a rise in the number of unexplained PPM failures, it is dwarfed by the rise in attributed PPM failures which have more than doubled in number per period since 2011. So we can at least be confident that the great majority of the deterioration is visible within the performance data. However there is a complication in this assertion which we address in section 3.9.



3.3 Right Time Arrival (RTA) breakdown

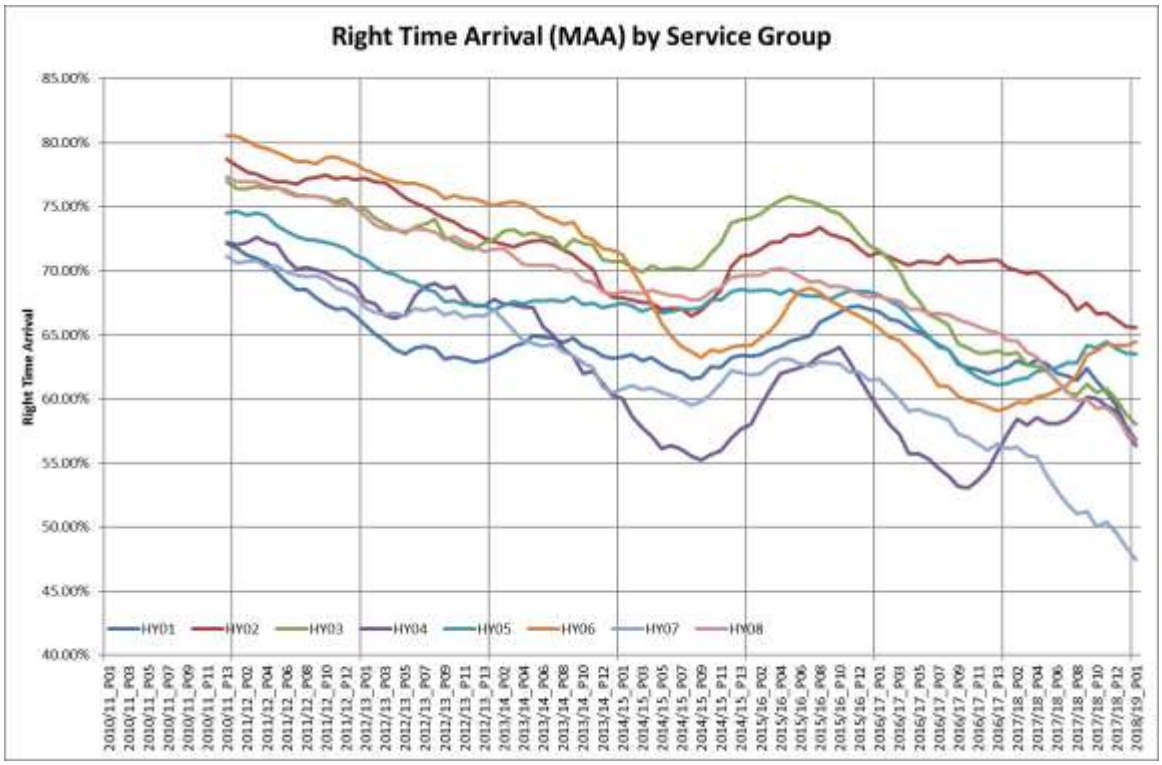
There has been a steeper decrease in RTA performance at a franchise level between April 2011 and April 2018 of 14.5%, falling from 74.6% to 60.1%. This fall is much greater than the equivalent fall in the PPM MAA and provides some evidence that a contribution to the overall fall in performance has come from low level delays such as time loss in running. This is because it indicates more trains are interacting with another than was previously the case, and more trains are suffering small delays which in the very tightly planned peak periods will generate congestion and reactionary delay sufficient to drag PPM down.



This deterioration can be seen to be quite different across different service groups. The Portsmouth service group (HY07) stands out as the worst performer, although the West of England service group (HY03) has fallen almost 20% since summer 2015, whilst the best performing service group was South Hampshire locals (HY02) at 66%, although even this has seen a fall of around 12% since the start of 2011/12. However, as this constitutes only 4% of the total service it is relatively immaterial in the wider context.

Interestingly the service groups using the Windsor Lines (HY05/HY06) have near identical RT arrival performance at around 64% and appear to have stabilised recently, whilst those using the Mainlines into Waterloo (with the exception of HY07) are all grouped around 57% RT but with considerable deterioration (-5%) since Period 8 of 2017/18, subsequent to the Waterloo blockade in Summer 2017. This suggests that the ability of services using the lower numbered platforms at Waterloo to achieve RTA has been adversely affected since the completion of the Waterloo Blockade. This is something that we consider in Section 6.6, and is probably associated with the 10-car operation implemented on the Main Suburban routes in December 2017.

As with the PPM results the range of RTA performance across the service groups has also widened. At the start of the 2011/12 financial year the range across the service groups was 71% to 81%, but by the start of the 2018/19 financial year this had widened to 47% to 66%.



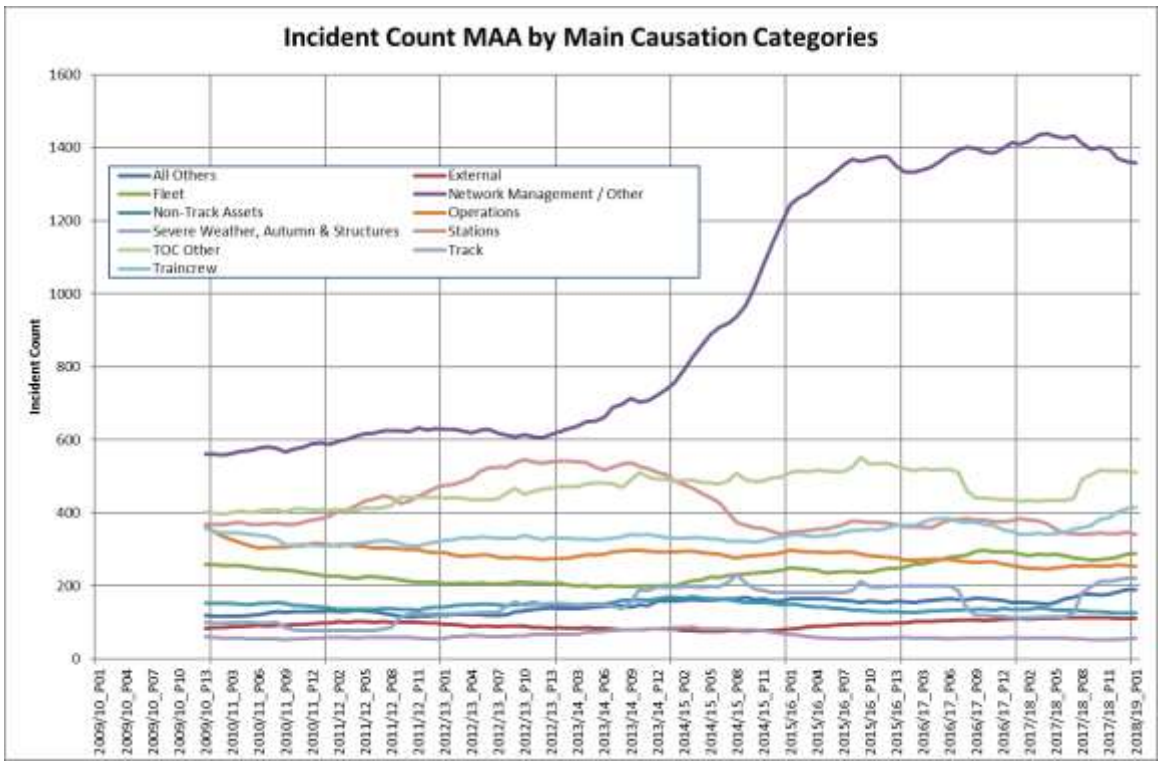
As with the PPM chart, the fall-off in RTA performance for trains using the lower numbered platforms at Waterloo in recent periods is a concern. It is opposed to the trend in the Windsor service groups in recent periods which have stabilised at around 65% RTA.

3.4 Incident Count (Incidents causing attributable delay)

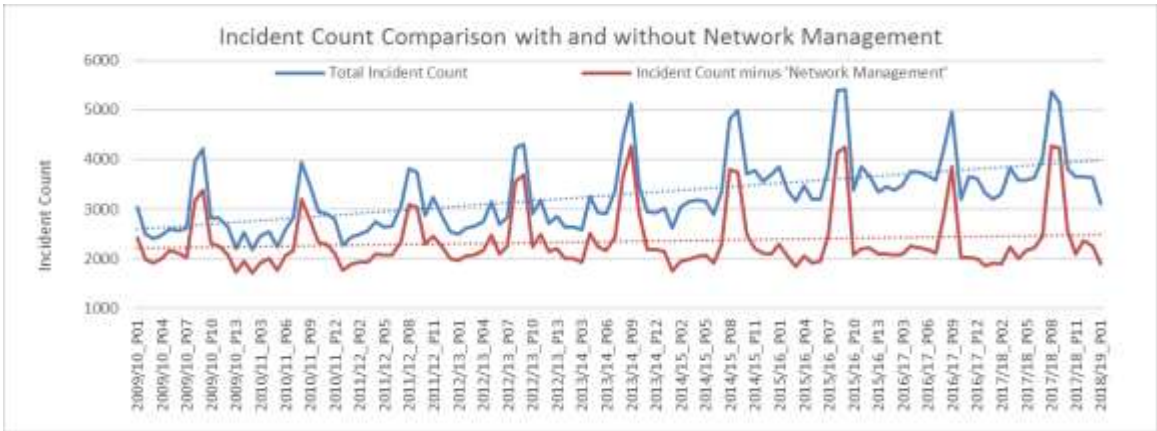
Incident Count does not in itself reflect the impact on the operational railway of delays but is instead a measure of the input of service affecting events that give rise to poor performance. As such it is a useful measure of underlying asset and system performance and reliability. It is reasonable to assume that a well maintained and effectively operated railway should see incident count gradually improving over time as a result of the application of continuous improvement techniques designed to eliminate repeat failures; at the very least, the incident count should remain relatively static.

The following graph shows the Incident Count MAA in the main causation categories since April 2010. Across the whole of the data period, the incident counts for the main delay

causation categories have remained relatively static and whilst there is some movement in the average period incident count it is relatively small. The best performing categories (defined as lowest number of incidents) throughout the period are 'Track', 'External' and 'Non-Track Assets'. In recent years Fleet and Traincrew have both increased by around 100 incidents per period, but the most significant change recently has been the increase in Traincrew incident count since period 4 of 2017/18 which has gone up by 75 incidents per period in just seven periods.



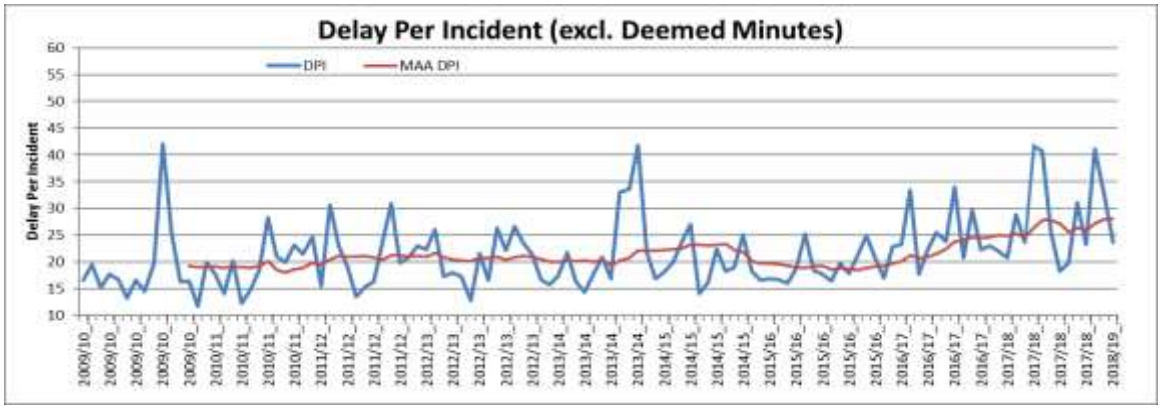
A clear anomaly in the data-set is the incident count of 'Network Management/Other' categorised incidents which has more than doubled over the data period. It is thought that this is a result of changes in attribution methodology that took place during 2013/14 under the tenure of the deep alliance. Whilst there is marginal to moderate growth in the incident count in most other categories, the Network Management category grew by 60%. The impact of the growth in incident count in this category is such that it skews the Incident Count data in the historic record. The evidence for this distortion is contained in the following graph which shows that the trend in growth in Incident Count for all other causation categories is small by comparison.



3.5 Delay Per Incident (DPI)

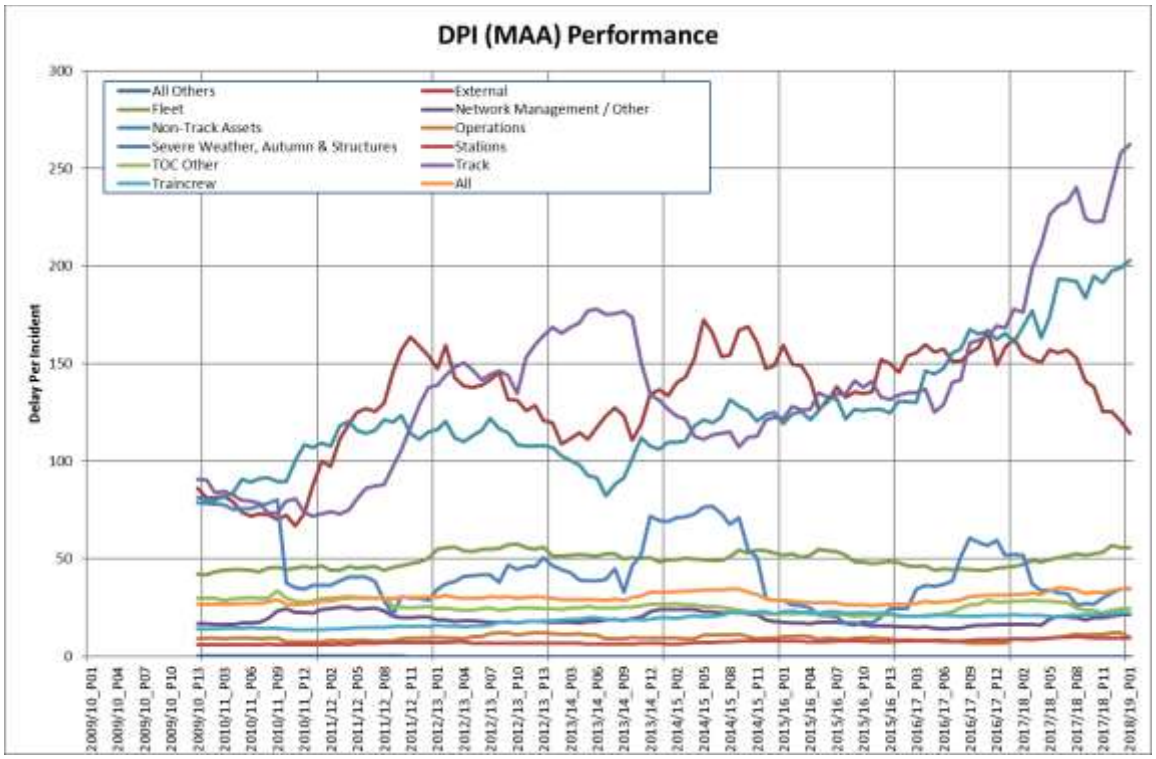
To provide context to the Incident Count information, DPI is a reasonable way of assessing the relative impact of each causation category on the train service at a high level. However, there are limitations to the usefulness of DPI because some high incident count categories (stations) have a relatively low impact and some incident types (track) can have relatively high impact.

Overall DPI has increased by 47% over the data period, albeit that at the start of the 2015/16 financial year DPI had returned to the same level as at the start of 2009/10. As with a number of the other metrics reviewed, this does suggest that the majority of the deterioration in performance to SWR services has occurred as a result of changes within the operation that have occurred since 2015.



In contrast to the previous review of Incident Count, the categories with the highest DPI impact are 'Track', 'Non-Track Assets' and 'External' (although this latter category has

improved in recent periods). All other categories, with the exception of 'Autumn & Severe Weather', which is heavily influenced by the type of autumn experienced, have remained relatively consistent throughout the data period albeit with some recent minor deterioration.



That 'Track' has remained at a stable level as an incident count, but is worsening in impact, suggests that the relative impact of each incident is growing more disruptive (such as an increase in 'line-closing' defects, or more severe speed restrictions), or that the location of the incidents that do occur is on the more densely operated sections of the route (i.e. closer in to London), or that incidents are becoming harder to manage or recover from, or a combination of all three factors. This increase comes in the context that the number of trains, and the train mileage operated within the timetable, has been relatively static since 2009. So the deterioration is not the result of more trains operating as might have been thought.

The same assessment can also be applied to 'Non-Track Assets'. What is concerning with both Track and Non-Track Asset DPI is that the deterioration appears to occur at roughly

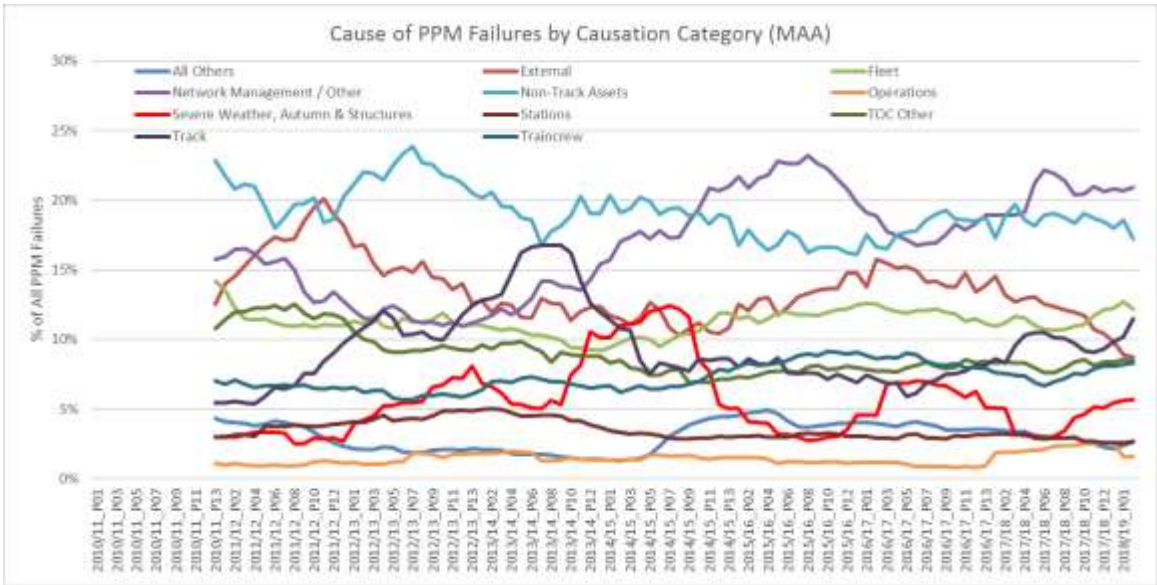
the same time at the start of the 2016/17 financial year, albeit it's hard to consider that either of these categories was 'in control' prior to this.

This increase in infrastructure DPI in the track and non-track assets should be a major cause for concern for NR, and needs to be a primary focus of the current and future performance improvement plans.

The relative stability of the other categories, allied to the fact that with an average of less than 50 minutes DPI, suggests that these categories are probably less prone to generating significant reactionary delays – no doubt a function of the fact that incidents in these categories tend to be experienced at a train level not at an infrastructure level and are thus less disruptive when they do occur.

3.6 PPM failures by causation category

A further assessment that can be undertaken is to breakdown the PPM failures by causation category. This generates quite a different picture to that which is presented when looking at DPI: whilst DPI suggests that the three biggest impact categories are Track, Non-Track Assets and External, analysis of the impact on PPM failures suggests that Network Management and Non-Track Assets are currently the highest impacting causation codes. The presence of Non-Track Assets (around 16% of PPM failures) is to be expected given the identified impact of this causation category in the DPI analysis, and it has consistently been in the top two causation categories for PPM impact since 2011. But as set out in Section 3.9 the presence of Network Management (21% of PPM failures) as the worst category is a major concern.



The surprising result is that Track accounts for only about 12% of PPM failures, although this has been highly variable over the data period being as high as 17% and as low as 6% and is on something of a negative trend currently, rising from 7% in mid-2016/17. External events on the other hand have traditionally been high contributors to PPM failure and most recently peaked in 2015 at 16%, but have since dropped to less than 10%.

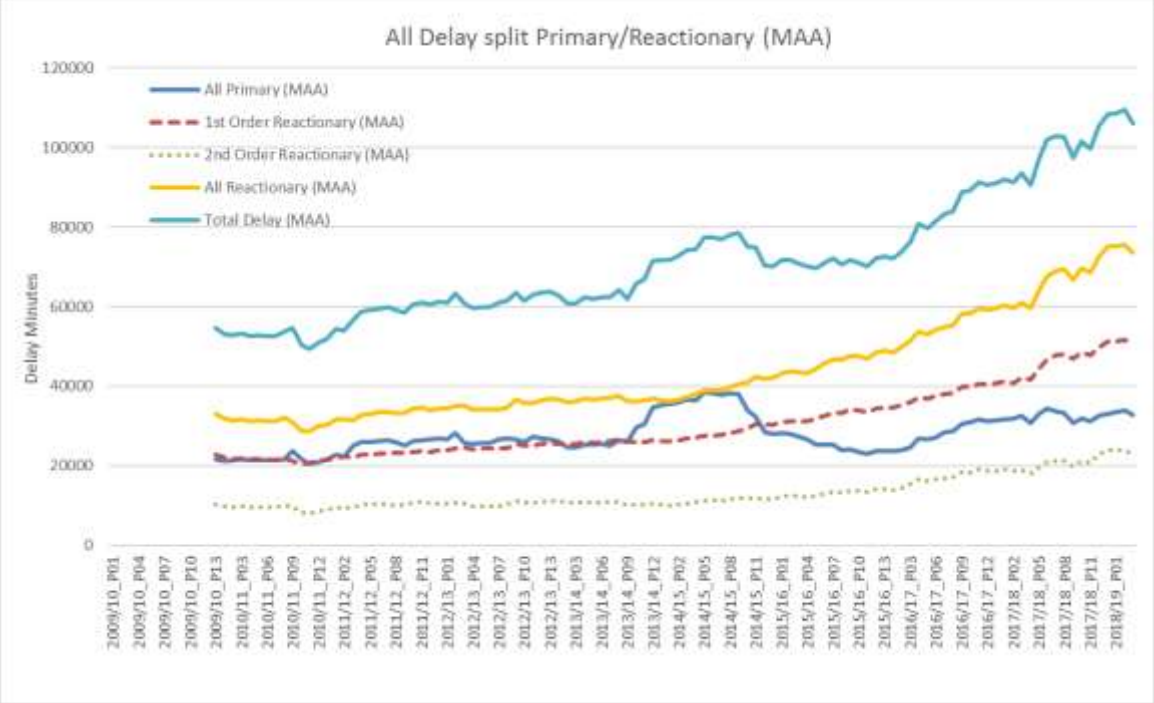
3.7 Total Delay Minutes

The total number of Delay Minutes has risen throughout the data period from around 54,500 minutes per period (MAA) at the start of 2010/11 to around 108,000 minutes per period at the end of 2017/18. This is a rise of 97% over seven years.

3.8 Primary/reactionary delay performance

Within the total delay minute count, it is possible to view the change in the type of delay being experienced. Primary delays are those experienced by trains as a result of the event occurring, reactionary delays are those experienced later on in the journey of the train as a result of congestion and late starts arising from the initial incident.

Primary delay has grown by 55% over the eight year review period (21,000 minutes in Period 1 2010/11 to 32,700 in Period 13 2017/18), although there have been two significant peaks in primary delay at 38,000 minutes (2014/15 P6) and 34,000 minutes (2017/18 P6). In recent years primary delay was at its lowest in 2015/16 Period 11 (23,000 minutes). So the decline over the last 2½ years (23,000 to 32,700) is almost the same as the long-term deterioration. It is worth noting that the long-term primary delay trend is skewed significantly by five periods of very poor performance in 2014/15 without which there would have been virtually no movement in the primary delay MAA between the start of 2010/11 and the start of 2015/16, but since then primary delay has grown by 50%.



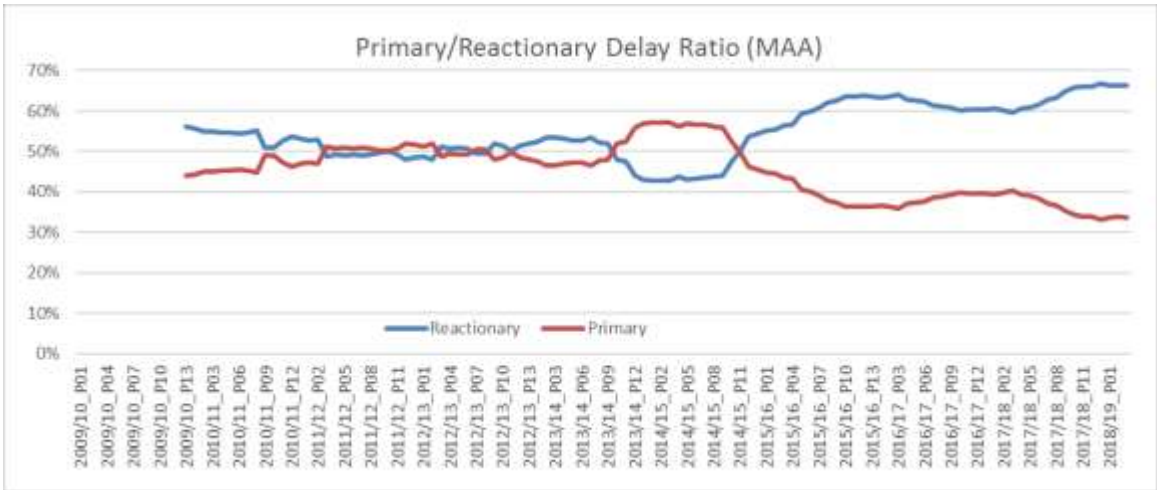
In contrast, reactionary delay (yellow line) has shown a consistent deterioration over the long term, with the rate of deterioration accelerating from the start of the 2014/15

financial year and then worsening again at the start of the 2016/17 financial year and again at the start of 2017/18.

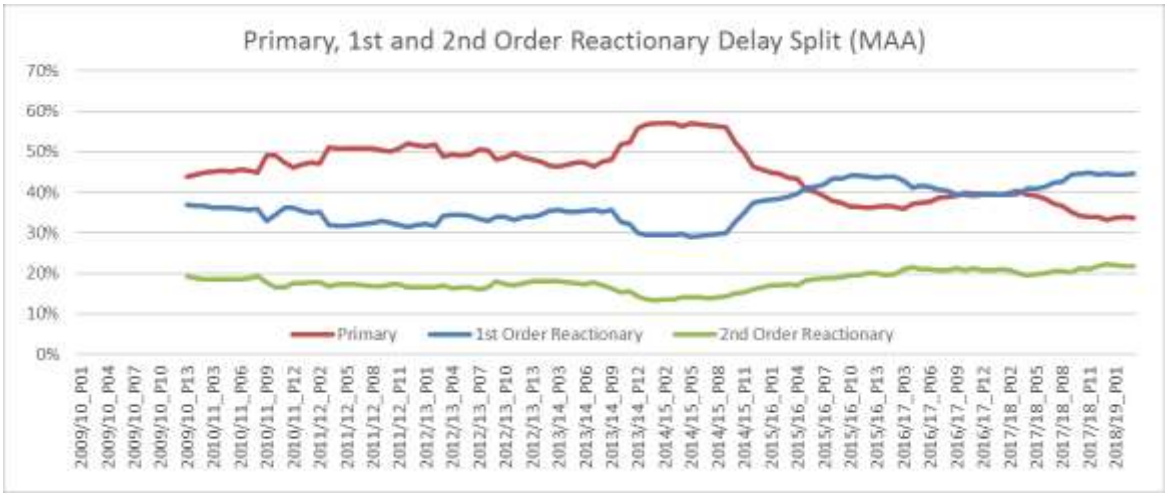
Reactionary delay can be split into two elements, first order reactionary delay which are delays occurring due to out of path running (congestion) – the red dashed line - whilst second order reactionary delays are predominantly delays which occur due to stock and crew displacement, resulting from late running – the green dotted line. Of these:

- First order reactionary delay has been on a consistent and accelerating worsening trend since 2010/11 Period 10 rising from 20,689 to 50,500 minutes per period by the end of 2017/18, and within this the rate of growth seems to change for the worse around 2017/18 Period 2
- Second order reactionary delay however was relatively stable through the first half of the data period, and it is only at the start of the 2014/15 financial year that it started to climb now causing 20% of all delay minutes incurred in a period (1 in every 5 minutes of delay)

What is very concerning however is the change in the nature of the relationship between Primary and Reactionary delay. The Primary/Reactionary delay ratio shows that for most of the period until the end of 2013/14 there was a reasonable degree of consistency with the ratio hovering around 50:50. In 2014/15 the ratio moved in favour of primary delay (as mentioned five very poor periods in that year skew the long-term trend) but by the end of that year the ratio had returned back to a near 50:50 split. However, from around 2015/16 period 4 the ratio has moved significantly in favour of reactionary delay from 55:45 to 67:33 at the end of the 2017/18 financial year – a situation that seems now to be embedded in the operation.



Further assessment of the data shows that both types of reactionary delay have been more prevalent within the SWR operation since December 2014, as per the graph below.



We believe this finding to be instructive given that the number of main delay causing incident types has been relatively static, as has the timetable. We conclude that the initial deterioration in PPM (the fall from 93.4% to 90.5%) occurred due to increases in direct delay and a proportionate increase in reactionary delay, but that from mid-2015 onwards the deterioration in PPM from 90.5% to 84.3% has arisen almost entirely due to the growth in reactionary delay. This now accounts for two-thirds of all delay incurred by SWR services.

3.9 Impact of Delay Attribution practice on Wessex Route

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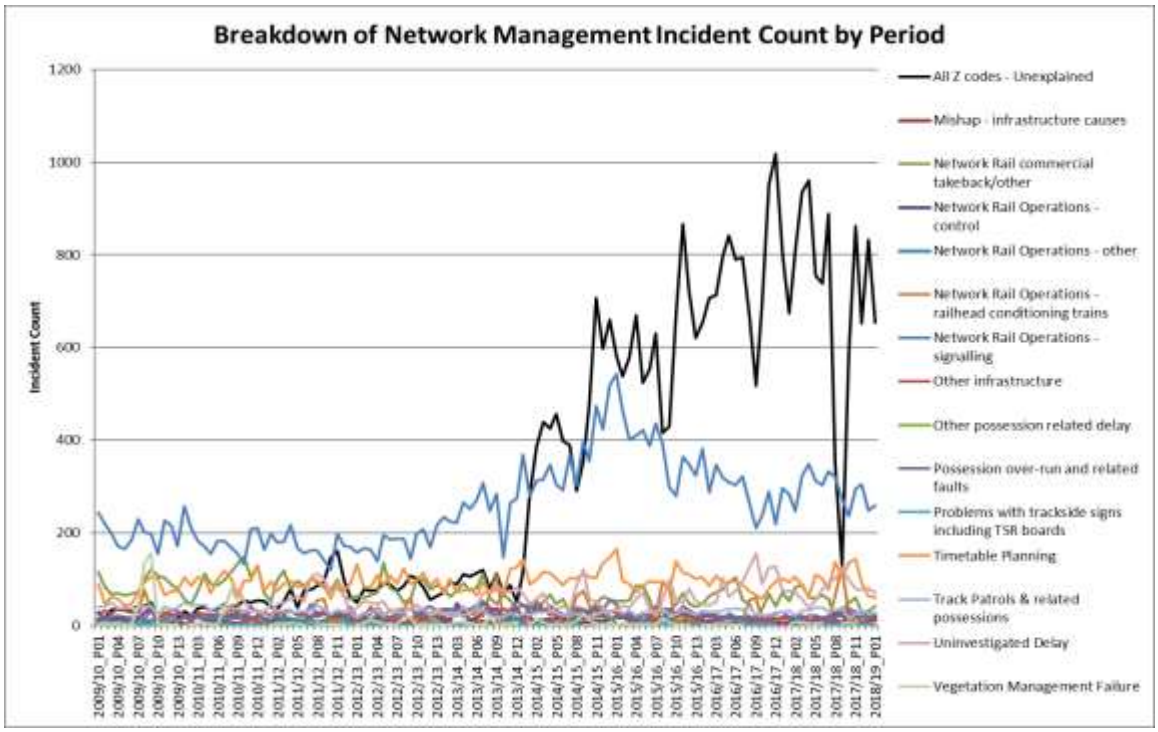
In section 3.4 a 'skew' was identified within the data in respect of the Network Management causation code which has the potential to undermine analysis of performance data and therefore undermine SWR and NR's ability to dive into the detail of performance on the Route to get to the root understanding of delay causation. A change in attribution practice arose due to adoption of national guidance from the Delay Attribution Board, implemented from the 25th April 2014, designed to improve the quality of above threshold attribution and avoid the generation of 'Management TINs' by disregarding sub-threshold direct delays (once identified) and the resultant reactionary delay – no matter how much occurs.

This means that if an alert is received within the TRUST-DA system[5] for a delay of 1 or 2 minutes the alert will be coded to ZZ[6] unless that alert arises due to a reactionary delay from another incident (in which case it is allocated to that incident). If the alert is identified as not being a consequence of another known incident then the alert, and any reactionary delay that might arise, is not subject to any further investigation and a single ZZ incident created. Every time this occurs during a day a new ZZ incident is created.

[5] A national system operated by NR and used to attribute all delays on the network according to a defined set of rules

[6] A code used within TRUST-DA for unexplained delays caused in running. See Delay Attribution Guide for more information.



The only exception to this is where a sub-threshold delay arises due to a known (and published) cause such as a 'networked TSR/ESR'[7] or previously advised traction defect.

The problem that has emerged, and which needs to be considered within the analysis being presented in this section, is that Network Management is now the largest causation category responsible for PPM failures (20% of all the trains that fail PPM) and probably half of those trains (i.e. 10% of the total number of trains that fail PPM) do so for totally unexplained reasons (the Z-code incidents). To give an indication of scale of the issues it is possible (based upon an assumption that 50% of the PPM failures in Network Management are 'investigated') that as much as 2.7% of the PPM lost in 2017/18 was due to trains failing PPM without explanation, as either the delays were not explained, not investigated or large enough to be attributed.

[7] Temporary Speed Restriction and Emergency Speed Restriction (see section 8). 'Networked' has a particular meaning within the Delay Attribution Guide

Coledale Consulting Ltd/Atkins Global

Period	Network Management Total PPM failures	Trains failing PPM due to Z-codes. (50% Estimate)	Trains failing PPM Unattributed Cause	Estimated number of trains failing PPM without Explanation	Total Number of trains failing PPM per period	% of Trains that failed PPM that have no Explanation	% Contribution to period PPM results
2017/18 P01	545	272	244	516	4242	12.17%	-1.09%
2017/18 P02	519	259	349	608	3683	16.52%	-1.32%
2017/18 P03	1089	544	423	967	6022	16.06%	-2.13%
2017/18 P04	984	492	476	968	5163	18.74%	-2.10%
2017/18 P05	3213	1607	336	1943	7477	25.98%	-4.55%
2017/18 P06	2327	1163	530	1693	8274	20.47%	-3.91%
2017/18 P07	1019	509	551	1060	6235	17.01%	-2.35%
2017/18 P08	991	496	831	1327	6127	21.65%	-2.97%
2017/18 P09	857	428	696	1124	6327	17.77%	-2.48%
2017/18 P10	2114	1057	654	1711	7707	22.20%	-4.16%
2017/18 P11	1286	643	501	1144	5765	19.84%	-2.59%
2017/18 P12	1532	766	575	1341	9729	13.78%	-2.97%
2017/18 P13	1820	910	547	1457	7754	18.79%	-3.24%
Full Year	**18295**	**9147**	**6713**	**15860**	**84505**	**18.77%**	**-2.73%**

It has also been noted that the Wessex Route is susceptible to the Delay Attribution process being overwhelmed by large incidents causing the creation of 'Management TINs'. These contain all the delays from a day that could not be investigated and attributed on the day. Typically, these Management TINs can start at many thousands of minutes in scale and over the following days minutes are re-attributed to the correct cause codes, although the longer this process takes the greater the loss of information that can be relied upon and consequently there is a residue of 'Un-investigated Delay' within the data.

Taken together, these represent in our opinion a significant deficiency within the quality of the management information available to understand and improve performance, especially given that much of the degradation in PPM performance appears to be as a result of small delay and conflicts within the day to day operation.

Committed Obligations addressing unexplained delay

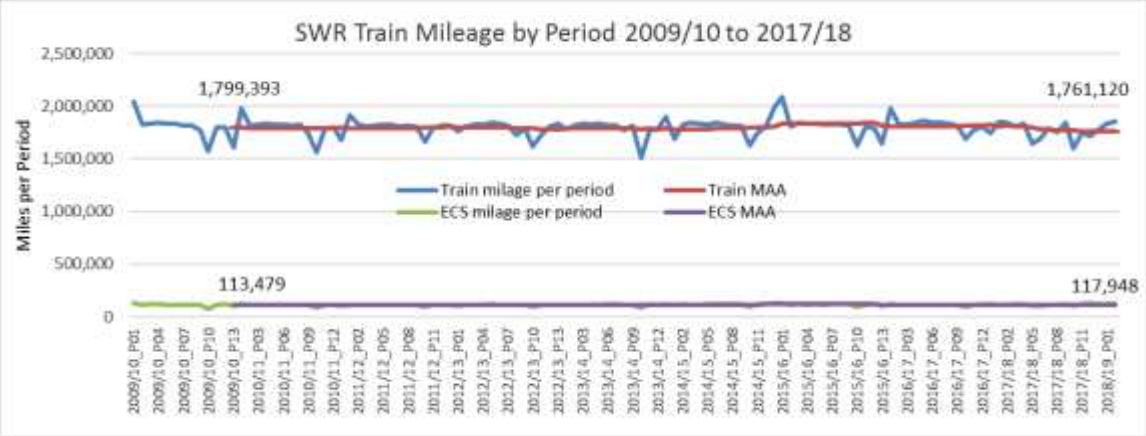
CO46 – SWR to reduce the number of unexplained delay minutes

Recommendation 1: NR should review its delay attribution policies (including those related to small-minutes and the attribution of unexplained delay) and the resources it makes available to effectively attribute delays. The aim should be for all delays and incidents to be investigated and explained

3.10 Underlying timetable structure

As mentioned in section 3.1, the underlying structure of the timetable has been unchanged since 2009/10 and for the most part since the 2004 timetable change following the Desiro fleet introduction.

MAA train service mileage in April 2010/11 was 1.794m miles per period. In April 2018 this figure was 1.761m miles per period, a fall of 33,000 miles per period, or 1178 miles per day on average. The current MAA figure is affected by last year's Waterloo blockade, but in essence the quantum train service mileage has not increased over the data period in any way and it is expected that by September 2018 the MAA will have returned to parity with the pre-Waterloo blockade number.



MAA ECS mileage has increased slightly over the same period from 114k per period to 117k per period an increase of 3k per period or around 107 miles per day. Again, this is not a significant change, but is a function of the December 2017 timetable change which saw changes to the off-peak stabling of trains on the Main Suburban routes following lengthening to 10-car operation.

There have been three notable alterations to the operating environment within the data period, these are:

- Introduction of 10-car operation on the Hounslow loop, Windsor, Weybridge and Reading lines from the December 2015 timetable change. This change saw the full introduction of the Class 458/5 fleet.

- Introduction of 10 car operation on the Mainline Suburban service from the December 2017 timetable change following the Waterloo enhancement works. This change saw the introduction of the Class 707 units, marshalling of Class 456 units into 10-car formations with 2 x Class 455 units and cascade of Class 450s to allow lengthening of selected service to 12-car operation.
- Changes to the design and layout of the Waterloo throat following remodelling for the 10-car operation, which has changed the operability and flexibility of the layout.

3.11 Franchise performance (PPM) expectation based upon historic data

In reviewing the historic data we noted that the bid phase for the South Western franchise coincided with the most recent highpoint in franchise PPM performance that being the 90% PPM achieved during financial year 2015/16. Since the tender was submitted the following has occurred:

- The PPM MAA fell from 88.9% to 87.1% in the period between submission of bids (end September 2016) and franchise award (end of March 2017)
- Between franchise award and franchise commencement (March 2017 to August 2017) the PPM MAA fell a further 0.6% to 86.5%.

The Performance Delivery Plan in the SWR bid was designed to take the PPM MAA from 91.02% at the end of March 2017 to the end of franchise target of 92.49%, rather than starting at 85.8% PPM MAA (over 4% lower than expected) as was inherited at the start of the franchise.

3.12 Summary of findings from the review of performance data

- Headline PPM MAA fell from 93.9% in January 2011 to 84.2% in March 2018.
- The timetable has remained static during this period, the only substantial changes have been longer formations on suburban services.
- Although the long term trend has been downward, there have been periods of recovery and subsequent stability, most notably in 2015/16 when 90% PPM was achieved, 1.2% better than in December 2014. This stabilisation occurred immediately prior to the ITT for the current franchise being issued.
- The most significant fall of 6% PPM occurred between April 2016 and April 2018.

- All service groups have seen a downturn in performance, with the worst falls in the long-distance groups (Portsmouth, West of England, Weymouth).
- The number of trains failing PPM has doubled in the review period, whilst total delay has grown by 77%.
- This, coupled with the increase in the number of trains failing PPM without explanation, and the more severe deterioration in RTA, suggests that congestion and small delays that were not prevalent prior to 2014 are major contributory factors in the deterioration in performance.
- The number of delay events in the main service affecting categories (Track, Non-Track, Fleet, External etc) has not significantly changed over the review period; so the strike rate for delay-causing incidents has not significantly contributed to the fall in Right Time and PPM performance.
- This stability in incident count also suggests that little progress has been made to drive improvement in underlying performance.
- The delay minute impact of 'Track' and 'Non-Track Assets' has worsened over the review period, and considerably so since the summer of 2015/16.
- In terms of relative contribution to PPM failures by causation code, Non-Track Assets and Network Management are the principal causes, followed by Fleet, Track and External.
- The increase in delay minutes has been driven by growth in reactionary rather than primary delays.
- The increase in low level lateness, and more significantly the growth in reactionary delay, in an environment with a broadly stable number of incidents and no change to the timetable structure, suggests that the railway has become progressively harder to operate over recent years. This is most likely to be the result of changes in the base resource plan for the service, and the capability, structure and processes put in place to manage the train service. It is probable that this progressive deterioration in operability is a function of combinations of:
  - Increases in passenger numbers
  - The number of traincrew available to operate the service, their traction and route knowledge, and the complexity within diagrams
  - Unintended or unassessed consequences of operating longer trains
  - Impact of two additional rolling stock types to the operation
  - Changes to the organisational structure for managing the service (Control and Duty Resource Management arrangements) over recent years
  - Changes to the capability of the network following the Waterloo remodelling

4. Organisational, leadership and cultural issues

4.1 Organisational change

Over the last eight year period there has been considerable turbulence within the south-western franchise, as highlighted in this table. We have also shown key operational changes which have occurred over the same time period.

Date	Organisational change	Date	Operational change
Summer 2011	Design work started to put in place a deep alliance between SWT and NR Wessex route	Feb 2011	Cap & Collar arrangement activated
Jan 2012	Tim Shoveller appointed MD; a number of executive level changes then made		
Apr 2012	Deep alliance went live		
Mar 2013	Talks initiated on possible Direct Award	Apr 2014	Class 456 Introduced
Jul 2015	Direct Award negotiations collapsed. Decision to hold franchise competition		
Aug 2015	End of deep alliance. Replaced by 'shallow alliance'	Jun 2014	Class 458/5 (lengthened and rebuilt) Introduced to operation
Aug 2015	John Halsall appointed RMD	Nov 2014	Class 455 re-tractioning. 1st unit into service
Feb 2016	Shortlisted bidders announced	Dec 2015	10 car operation on Windsor Lines
Feb 2016	Christian Roth appointed SWT MD		
June 2016	Stuart Kistruck appointed RMD (Acting)		
July 2016	Franchise ITT issued		
Nov 2016	Becky Lumlock appointed RMD		

Mar 2017	Margaret Kay appointed SWT MD		
Mar 2017	Winner announced	Apr 2017	WICC move to Basingstoke completed
Aug 2017	Franchisee change; all Directors changed on same day	Aug 2017	Class 707 – 1st unit into service
		Aug 2017	Waterloo Blockade. Revised track layout.
		Sep 2017	Class 707 enter passenger service (all in traffic by March 2018)
Apr 2018	Change of Performance & Planning Director	Dec 2017	10 Car operations on Main Suburban

We can see that, far from a period of stability existing, as might be thought given that the same franchise owner ran the business for a 22 year period, the last eight years have been characterised by very considerable managerial distraction and change. In particular, it should be noted that that the creation of the deep alliance represented a radical change for the industry and took a large amount of senior management effort to establish. Once live, the focus of the unified senior management team led by Tim Shoveller tended to shift away from operations and onto infrastructure, where there were a series of pressing challenges to be addressed.

The organisational cultures of NR and Stagecoach were markedly different, and their incentives were also significantly misaligned. This meant that much time and effort was spent in managing upwards. In the event it proved impossible to agree a financial gain/pain share arrangement that had any depth, and that was sufficient to incentivise appropriate behaviours. Eventually the deep alliance became unsatisfactory for both parties, and was formally unwound and replaced by a more conventional shallow alliance.

During this time the Department for Transport (DfT) had also announced its intention to replace the last franchise with a Direct Award. The negotiation of this again took significant management effort and diverted the focus away from operations, and

especially performance. These negotiations failed, and this led to a fresh franchise competition.

The period of tenure of Christian Roth as Managing Director was overshadowed by two things: the franchise competition itself, and the South West Capacity Upgrade programme, in which Christian Roth was intimately involved. This programme had its own challenges and caused significant managerial distraction until the Waterloo blockade was over. One consequence of this period of time was a further lessening of focus on performance management. The appointment of a Performance Director in 2016 was a belated admission of the size of the problem; however the appointment proved to be ineffective as it was seen as temporary and was not meaningfully supported by the executive team.

The last few months of the franchise were characterised by uncertainty at executive level as to what was to come, the challenges of the South West Capacity Upgrade, and mobilisation for the looming franchise change.

Once the franchise had changed hands things became arguably even more difficult: the Waterloo blockade had to be completed with as little disruption as possible, the Class 707 fleet had to be introduced into service and 10-car operation introduced onto the Main Suburban network. On top of this the new franchisee had to contend almost immediately with a significant industrial dispute with its guards belonging to the RMT union. This dispute continues to this day and has sucked up enormous managerial effort in the handling of its various aspects and consequences.

The new executive team had no time to establish itself properly and has struggled to find sufficient time to 'on board' the management team and the workforce with the vision and ethos of the new franchise. The change of franchisee, after a 22 year period of single ownership, came as a big change of culture to the managers working within it. Stagecoach had developed a fairly devolved and non-bureaucratic style of ownership, whereas the First Group style is more centralist and stronger on 'command and control'. There has inevitably been some fallout from this abrupt change. This has manifested itself in a degree of churn at senior management level, particularly at heads of function level. Two out of the eight heads of function within the operational parts of the company have changed in this time, and a number of others in other functions. Four of the directors changed during the first nine months of operation of the franchise, (although only one of

these, the Planning and Performance Director, is directly involved in the operational part of the business). This post was itself a new role introduced by SWR at the time of franchise change to tackle what was identified as a shortcoming, and was only occupied on a temporary basis by the original individual.

Furthermore, there are a very substantial number of committed obligations contained within the new franchise agreement. These have taken, and continue to consume, considerable managerial effort within the franchise team since the franchise start date, and can be seen to have acted to inhibit efforts at getting to grips with the inherited performance challenge.

This very short potted history of the organisational turbulence which has occurred within the franchise over the last eight years provides some context within which to view the decline in performance which has occurred over this timeframe.

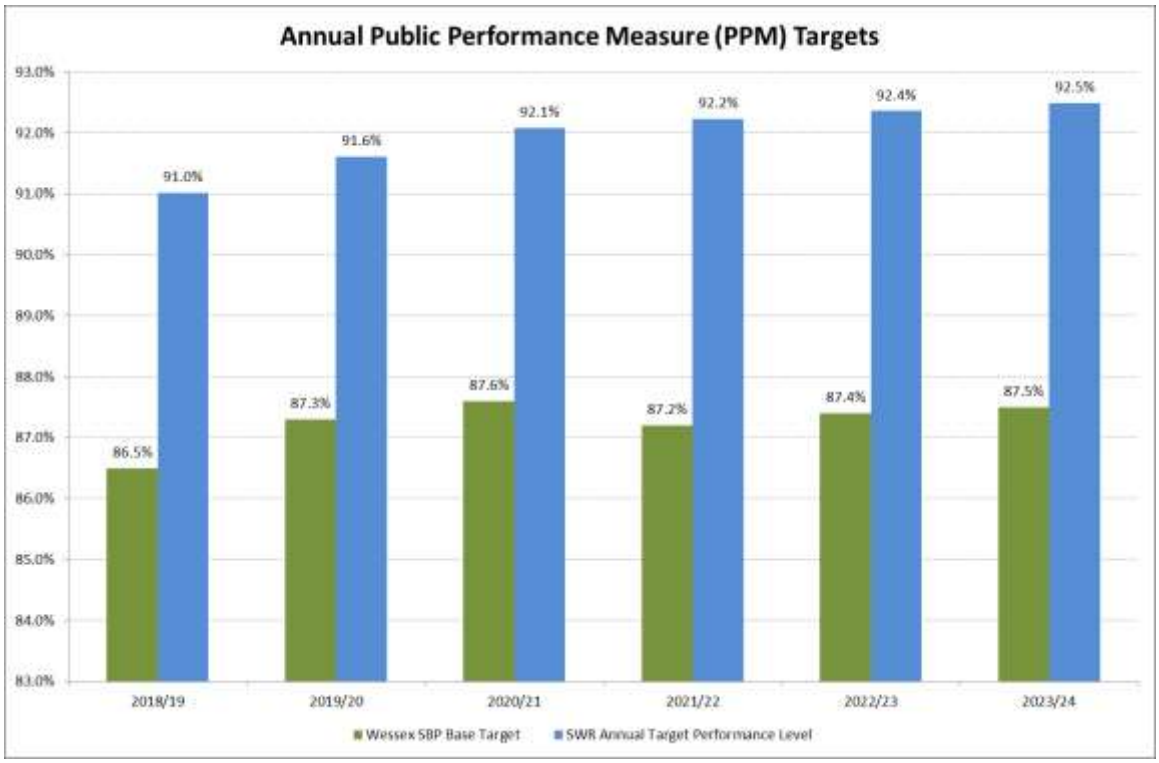
4.2 Misalignment of incentives

The railway network is best viewed as a complex system, one in which all the elements need to work together effectively if the end result is to be the desired level of operability. Given that in today's railway organisational structure there is an organisational, commercial and contractual split down the middle between train operations and infrastructure provision, it is very desirable that incentives should be aligned between the key parties.

Unfortunately we have a position today where the incentives are clearly non-aligned. Network Rail's objectives are set for it through each Control Period by the Rail Regulator (ORR), whereas South Western Railway's objectives are set through its franchise agreement. Whilst there is obviously some extent to which these objectives are pointed in the same general direction, they do not dovetail explicitly at all.

The most obvious area where alignment would be highly desirable is that of performance. Here the key metric in the current performance regime is the Public Performance Measure (PPM). Whilst there is some negotiation taking place currently (through the 'draft to final' determination phase of negotiations) between NR and ORR on what the exact PPM target for the Wessex Route ought to be, the targets NR has established for

itself through its Strategic Business Plan and the targets SWR has committed to through its Franchise Agreement are quite different, as shown in the chart below[8].



NR argues that it is not currently funded to deliver a railway performing at this level. Its view is that without its specific planned interventions PPM would naturally decline by 0.4 percentage points in each of the next five years. Even with all its proposed interventions performance is only projected to improve over CP5 by one percentage point.

SWR, on the other hand, submitted its bid to DfT in September 2016, when the MAA for PPM stood at 88.9%, as noted in section 3.11. At this time its proposed performance

[8] It should be noted that the franchisee's targets were set in June 2016 as a key part of the Invitation to Tender document, whereas the Network Rail targets have only just been determined.

trajectory would have looked potentially achievable. But between bid submission and franchise award some six months later PPM had declined to 87.1%. By franchise start date it had dropped further to 86.5% meaning that the new franchise had a mountain to climb to get back to anything resembling a financially and politically acceptable position. This is an unusually acute level of decline in the period between bid submission and franchise start date. Unfortunately the downward trend has continued since, if anything on a sharper rate of decline, to reach 83.3% in August 2018.

There is an argument here for some form of reset mechanism to be contained in franchise agreements to allow for the impact of significant baseline change between franchise bid submission and start date. Whilst no reset mechanism exists in the current templated agreement, if such a change could now be considered for retrospective application to this franchise agreement it would go some way to reducing the scale of misalignment between the parties, and create a more realistic opportunity for the team at SWR to become galvanised around recovering towards a more attainable objective.

Recommendation 2: DfT should reconsider re-baselining the franchise performance regime to allow some relief from the deterioration seen between bid submission and franchise start date

The net result of the different way that objectives and incentivisation are set for both the two key parties is to create a serious misalignment between them. The extent of this misalignment closely matches the difference between a clearly unacceptable level (87.5% and a broadly acceptable level of performance (92.5%) for this railway. The fact that both NR and the franchisee are both under the direct control of DfT means that it ought to be possible to ensure much closer alignment of key objectives.

Recommendation 3: DfT should consider how it could instigate steps to create a better alignment of performance incentives between SWR and NR for CP6.

4.3 Alliancing behaviours

SWR committed within its franchise agreement to a form of alliance with NR. The form of this is specified within the Alliance handbook and covers four activity areas: Waterloo station, train planning, performance management and Control. Each of these has a unified organisation for it, and a single leader who reports appropriately into both organisations.

It is fair to say that the alliance in this guise has had a difficult infancy. On the NR side there was in depth experience of working in both a deep alliance and the shallow alliance that followed it. Alliancing behaviours were thus deeply ingrained within the organisation and its key managers and leaders. On the SWR side the managers were also used to working in an alliancing style. The new leadership team at SWR arrived without this background and therefore were minded to look for a more conventional commercial and contractual relationship between the parties. This change in style was effectively encouraged under the terms of the franchise agreement, which contains a clause to the effect that the franchisee should actively manage the performance by NR of its contractual relationship with the franchisee.

Due to the nature of the franchise start up (during the blockade and then almost straight into a major industrial dispute) there was little or no time to carry out the developmental activities normally associated with forming an alliance between two organisations.

Many of the behaviours developed during the deep alliance had survived through the last two years before the franchise change so in some ways there was possibly a closer relationship in place that one might have expected to see in a shallow alliance.

This situation has led to some tensions in the key areas of Control, train planning and performance, where the two alliancing parties have sometimes had different priorities and approaches. The managers leading each of these parts of the business have been put under extra strain as they have on occasion been pulled in different directions and have lacked guidance from above as to how to resolve these tensions. Arrangements at Waterloo station appear to work better, but this may be more down to the force of personalities of the people involved.

From a number of unattributed discussions with managers in both businesses it has become clear to the review team that the alliance is working more in name than in practice. We coined the term “pretend alliance” to describe this phenomenon, and were surprised how widely this resonated with people.

This seems particularly apt in respect of the Control organisation, where we formed the view that the SWR staff within the Control have effectively been marginalised and have

not benefited from active leadership. The culture within the Control is strongly led by NR currently, and SWR seems to have lost much of its ability to influence decision making[9].

Given that the alliance operates in four areas which are probably the most critical to the effective performance of the railway as a system, the weaknesses in Control and in Performance have developed into an unsatisfactory situation and need to be tackled. The alliance either needs to be reinforced, and made effective, or else it needs to be formally disbanded and the integrated teams separated out.

Recommendation 4: SWR and NR should review the operation of the existing alliancing arrangements with a view to either reinforcing them or easing them as best suits both parties.

5 Performance management processes and capability

5.1 Performance management process

There was a period of time towards the end of the last franchise where some good performance management processes previously in place appear to have been in decline.

SWR introduced a new Performance Management Handbook in February 2018 which documents how performance management is supposed to work both within SWR itself, and jointly with NR through the Alliance. Whilst this contains much useful material, in our view it is deficient in a number of ways.

Much worse than this, however, is the fact that it is not being applied effectively at all levels within the two businesses. We have been shocked by the paucity of effective performance management information provided to key managers and directors. The content of key information packs provided to the executive level Performance Steering

[9] During this review period SWR has taken steps to strengthen its management capability located at the Basingstoke Regional Operations Centre

Group, and the heads of function level Performance Delivery Group has been seriously deficient.

In addition, there has been no effective linkage between the PDG level and the Right Time Running Hubs, which are the only place below whole route level where performance analysis and review is routinely conducted. The RTR Hubs have clearly lost their way, being seen as ineffective and not having the means to make even small scale changes designed to improve performance at local level. Given the variability in the levels of performance achieved by each of the service groups (see sections 3.2 and 3.3) this is a particularly worrying situation.

Most of the performance material which is prepared for review by managers and directors is backwards focused, there is very little forward projection of existing trends or initiatives.

In many key areas of performance management the information which is reviewed as part of managing the business (as opposed to reporting upwards to the parent owning companies or compliance reporting to DfT) is seriously deficient. Here are some examples of information for which data and/or trends do not appear to have been regularly reviewed:

- PPM by service group
- PPM by day of the week
- Right Time Starts at all or by location
- Right Time Starts from depots
- Right Time Arrivals by location
- On Time performance at calling points (to be a regulatory measure in CP6[10])
- Short formations
- Part cancellations
- Skipped stops

[10] Control Period 6: the five-year long Regulatory period starting in April 2019

- Worst performing trains
- Sub threshold delays
- TSRs and ESRs

There is an enormous wealth of performance related data available in the system, but so little of it is being used meaningfully to drive corrective actions. For example, the 'worst train analysis' for 2017-18 year is instructive. It reveals that 20 trains had RT arrival performance across the whole year of less than 10%, and another 20 had PPM performance of less than 50%. This should be driving questioning of the routine causes of delay, which can be established by examining "washing line" line of route delay charts which are freely available in the NR database. But as far as we can see no one anywhere in the Route or the TOC is doing this.

There also appears to have been an issue in respect of delay attribution which suggests that accurate attribution to root cause and the identification of fault/failure in all circumstances has been seriously undermined by the wholesale adoption of revised sub-threshold delay guidance (section 3.9) and the approach to fleet performance attribution (section 10.3). We consider it likely that this loss of focus on small delays, and the movement of incidents away from root cause to failures of mitigation, are likely to have led to a false understanding of the reality of operational performance.

We also found that the performance improvement planning process has been neglected in recent years, and that where it does operate it seems to do so largely without reference to the fact that performance is on a declining trend and that therefore things will get worse if no corrective action is taken[11].

[11] Although it should be noted that, at the macro level, NR predicts that PPM will continue to deteriorate at 0.4% a year through CP6 unless additional funding is provided

Committed Obligations addressing Performance Process

CO47 – SWR to introduce a 'structured and analytical approach' to performance improvement, this includes the development of the Performance Handbook, an annual risk identification and mitigation process and a structure for cross-industry performance improvement meetings. Also included is a fund available for the first 18 months of the franchise to support fatality prevention measures.

CO54 – Implement a data hub to collate sources of 'Right Time' performance information, develop a sub-threshold delay tool and incorporate sub-threshold delay reduction plans into the Performance strategy

CO55 – SWR to establish an Extreme Weather and Planned Disruption Action Team to co-ordinate each department's disruption plans and response to extreme weather events and planned disruption.

Recommendation 5: SWR and NR should work together to overhaul and dramatically improve performance planning, reporting, analysis, and forecasting

Recommendation 6: SWR and NR should overhaul the current ineffective performance management meeting structure

5.2 Performance management capability

5.2.1 Integrated performance team

Whilst the performance management team is theoretically an integrated one, NR appears to make little use of it, leading much of the analysis using its systems and experts at the Basingstoke campus. Positioned on the 7th floor at Friars Bridge Court, the team feels relatively isolated from much of what is going on elsewhere in the parent organisations, and appears to have been left much to its own devices for quite some time prior to the franchise change, and then until the arrival of [redacted] as Interim Head of Performance. It feels to us to be a weak and ineffective team, lacking some of the skills and experience necessary to play its important enabling role effectively. But it probably also the case that a lack of leadership and goal setting over a period of time may be a significant part of the problem.

During the period of this review SWR has bolstered the team by the addition of two new analyst posts. It is too soon to comment on whether these posts will be sufficient to make the difference that is currently needed.

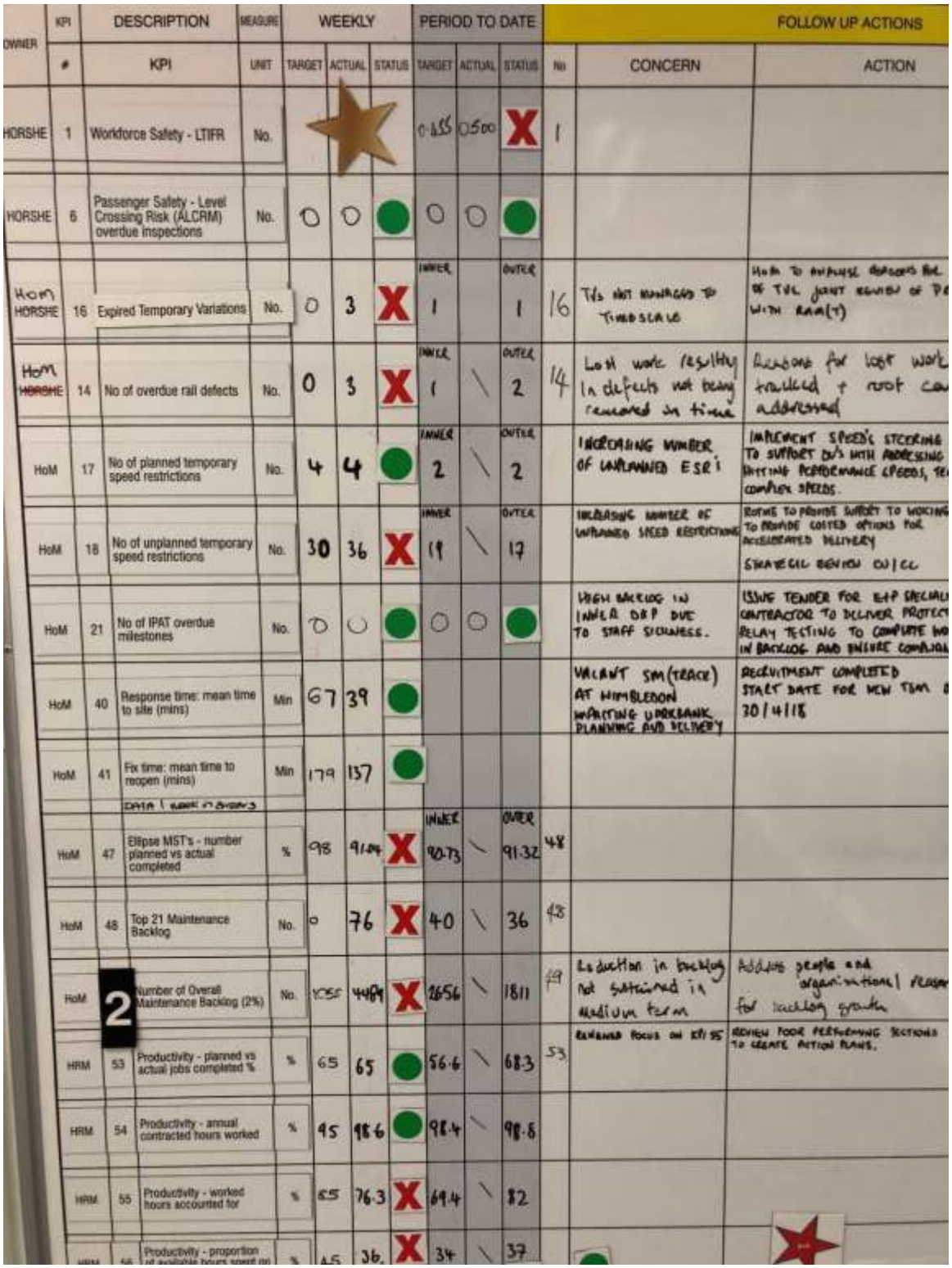
Recommendation 7: SWR and NR should review their combined capability and capacity for performance analysis and management and further strengthen it if appropriate.

5 2.2 Network Rail performance structure

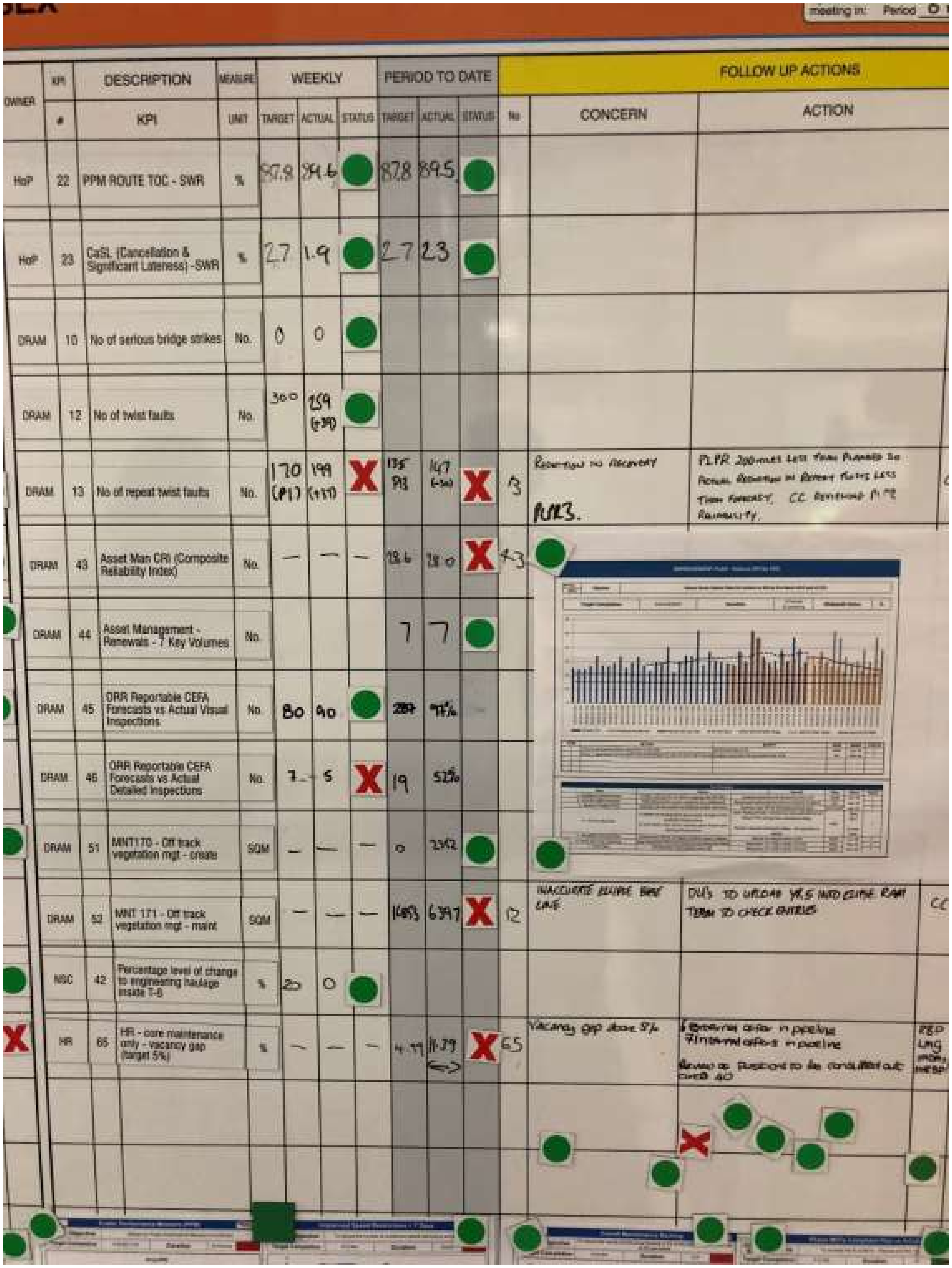
NR has a much more structured internal approach to the management of its delivery activities which include performance. This includes a hierarchy of inter-linking weekly visualisation meetings. These are short, sharp sessions held standing up: depot level meetings feed into functional level meetings, which feed into the Route level meeting which then feeds into a national level one. Meetings review a large series of KPIs on all matters affecting delivery, and generally consider those which are not meeting target.

This is a well-established system applied to the whole of NR, so our comments can address only what we observed occurring at the meetings we attended. Our pictures below show only the two whiteboards intended to show a summary of the position of the Wessex Route. These show 29 KPIs, but the remaining whiteboards total 142, all intended for review within a 60 minute timeframe.

Each KPI is shown as Red (if worse than target) or Green (on or better than target). Those in red should have text added showing the concern identified and corrective actions being taken. As you can see in the pictures, this is not being universally applied. Targets are derived from a mix of regulatory objectives, centrally driven objectives, and route-determined ones.



OWNER	KPI #	DESCRIPTION / KPI	MEASURE / UNIT	WEEKLY TARGET	WEEKLY ACTUAL	WEEKLY STATUS	PERIOD TO DATE TARGET	PERIOD TO DATE ACTUAL	PERIOD TO DATE STATUS	FOLLOW UP ACTIONS No	CONCERN	ACTION
HORSHE	1	Workforce Safety - LTIFR	No.				0.655	0.500	X	1		
HORSHE	6	Passenger Safety - Level Crossing Risk (ALCRM) overdue inspections	No.	0	0		0	0				
HoM HORSHE	16	Expired Temporary Variations	No.	0	3	X	INNER 1		OUTER 1	16	TVs NOT MANAGED TO TIMESCALE	HoM TO ANALYSE REASONS FOR OF TVR JOINT REVIEW OF P WITH RAM(T)
HoM HORSHE	14	No of overdue rail defects	No.	0	3	X	INNER 1	\	OUTER 2	14	Lost work resulting in defects not being removed in time	Reasons for lost work tracked + root ca addressed
HoM	17	No of planned temporary speed restrictions	No.	4	4		INNER 2	\	OUTER 2		INCREASING NUMBER OF UNPLANNED ESRi	IMPLEMENT SPEEDi STEERING TO SUPPORT DU's WITH ADDRESSING LIFTING PERFORMANCE (SPEEDS, TE COMPLEX SPEEDS.
HoM	18	No of unplanned temporary speed restrictions	No.	30	36	X	INNER 19	\	OUTER 17		INCREASING NUMBER OF UNPLANNED SPEED RESTRICTIONS	ROPME TO PROVIDE SUPPORT TO WORKING TO PROVIDE COSTED OPTIONS FOR ACCELERATED DELIVERY STRATEGIC REVIEW DJ/CC
HoM	21	No of IPAT overdue milestones	No.	0	0		0	0			HIGH BACKLOG IN INNER D&P DUE TO STAFF SICKNESS.	ISSUE TENDER FOR E&P SPECIALI CONTRACTOR TO DELIVER PROTECT RELAY TESTING TO COMPLETE WO IN BACKLOG AND ENSURE COMPLIA
HoM	40	Response time: mean time to site (mins)	Min	67	39						VACANT SM (TRACK) AT WIMBLEDON AWAITING WORKBANK PLANNING AND DELIVERY	RECRUITMENT COMPLETED START DATE FOR NEW TSM 30/4/18
HoM	41	Fix time: mean time to reopen (mins)	Min	179	137							
HoM	47	Ellipse MST's - number planned vs actual completed	%	98	91.04	X	INNER 90.73	\	OUTER 91.32	48		
HoM	48	Top 21 Maintenance Backlog	No.	0	76	X	40	\	36	48		
HoM	2	Number of Overall Maintenance Backlog (2%)	No.	4055	4484	X	2656	\	1811	49	Reduction in backlog not sustained in medium term	Address people and organisational reason for backlog growth
HRM	53	Productivity - planned vs actual jobs completed %	%	65	65		56.6	\	68.3	53	REVISED FOCUS ON ESRS	REVIEW POOR PERFORMING SECTIONS TO CREATE ACTION PLANS.
HRM	54	Productivity - annual contracted hours worked	%	95	98.6		98.4	\	98.8			
HRM	55	Productivity - worked hours accounted for	%	85	76.3	X	69.4	\	82			
HRM	56	Productivity - proportion of available hours spent on	%	45	36.	X	34	\	37			



ATKINS
Member of the SNC-Lavalin Group

Whilst the visualisation concept is a sound one, in our opinion there are a number of issues with the approach as it is being applied here:

- There are simply far too many indicators being reviewed in too short a timeframe. It is important to focus at each level on the things that are most important at that level rather than trying to manage everything this way.
- A critical area of sub-standard delivery can show as green simply if the number meets the target level set, even if that target is set at an arbitrary or unsatisfactory level; this can normalise poor performance. For example, the number of Temporary and Emergency Speed Restrictions, for which the target in this particular week was set at 30, is at an unacceptably high level for this Route.
- The approach has encouraged a "never mind the quality feel the width" culture, as 'chasing the green' becomes more important than chasing down the really vital few things that will make a real difference.
- The amount of time and effort being consumed by managers at various levels, each preparing for and participating in typically two or three of these meetings each week, is massive, probably around 20% of their total working time in a year. Obviously much of this is monitoring that is required as part of their day to day jobs, but it feels to us as if it has become an all-consuming activity on Mondays each week and is simply taking up too much time and energy.
- Performance is considered as a separate board run by the central performance team, and is only considered in this way. So it rather feels that each of the functions is not expected to 'own' their own contribution to performance delivery. The only point in the meeting where delay minutes, for example, are considered is in the performance overview part, and then only at an aggregate level.

NR itself seemed to feel relatively upbeat about its own performance during the earlier stages of this review, pointing to improvements in the number of service affecting failures and its relatively strong performance in the league table of Composite Infrastructure Reliability Index across the Routes[12]. This culture seems to miss the fundamental point that even if the incident count is relatively static over time, the impact of these incidents

[12] Over the review period it has come to accept that its own performance is on a deteriorating trend.

is so much greater than it used to be. Rarely did we hear an attempt being made to explain this coherently.

Recommendation 8: NR should review its visualisation practice as applied within Wessex Route to focus on critical aspects of delivery and to use time more effectively.

5 2.3 Interactions between NR and SWR relating to performance

It appears to us that there is little effective challenge between the parties, quite odd given the extent of the performance problems being experienced. There are probably a number of factors at work here:

- A hangover within the management (not the leadership) teams from the deep alliance during which time a collaborative (non-challenging) culture prevailed
- A 'feeling of the way' between the leadership teams since the change of franchise coupled with a desire not to become confrontational whilst developing the relationship
- A lack of effective leadership of the integrated performance team
- A crowded agenda for the new SWR executive team as it seeks to bed in its new leadership team and reshape its management team, understand more properly what it has inherited, progress its bid plans, meet its multitude of committed obligations, and cope with a challenging industrial dispute, whilst dealing with the aftermath of the Waterloo blockade, getting the Class 707 fleet into traffic after delays achieving gauge clearance in the previous months, and introducing 10-car working onto the Main Suburban service group
- Both parties have significant performance challenges of their own to address, and possibly don't want to be put in the metaphorical position of throwing stones from inside their own glasshouse.

The net result has been one of drift in the management of performance, and at a critical time for SWR. The good news is that this has been recognised and addressed. A new Performance and Planning Director has been appointed whilst this review was underway and started work in April. The new Performance and Planning Director has the requisite experience and expertise to ensure that the various deficiencies outlined above are addressed quickly.

Recommendation 9: NR RMD and SWR MD should overtly support a relaunch of the SWR performance management system led by the new Performance and Planning Director

6. Core resilience of the timetable

We consider that a deterioration in the core resilience of the timetable is one of the two biggest single issues causing the performance decline we have seen since 2011. What has caused this?

The current SWR timetable structure dates from 2004. Some detailed changes have been made since then, and other Operators such as Southern, Great Western Railway, Cross Country, London Overground, Freightliner, and others have made a number of other changes of their own during this period of time. Probably the most significant change to SWR services has been the increase to hourly services between Yeovil Junction and Exeter St. David's which occurred after the loop at Axminster was extended in 2009. But the basic structure remains intact, and the total SWR train mileage operated has remained quite stable over this time. Yet performance as defined by PPM improved steadily from 2004 until 2010, and has declined since 2011 by virtually every metric we can use.

A railway network such as the Wessex Route can be seen as a single very large, and exceptionally complex, system; one in which all the factors need to come together and be effectively integrated in order for it to work properly; and one that is so tightly utilised that it demands a precision approach to maintenance, timetabling and operation if it is to perform to a high standard.

The three key groups of tracks into Waterloo are served by the Main Suburban, the Main Line, and the Windsor Lines services. Each operates during the three hour morning and evening peak period at close to its practical capacity given the stopping patterns built into the timetable. During the high peak hour the infrastructure is effectively completely utilised. Any train running even slightly out of path during the three hour peak period, in either direction, can be expected to create a knock on impact to several other trains. So it can be seen that, if the railway system as a whole is to perform to a high level of punctuality, it is vital that the timetable is constructed with great care with regard to junction margins, reoccupation times, terminal turnround times, dwell and running times, and that every train then runs precisely in its allocated path.

Right Time Arrivals can be seen as an early indicator of problems with timetable resilience. As we saw in Section 3 these have collapsed across all service groups over the last eight years.

From observations we have made and discussions with a large number of managers and staff across both NR and SWR we believe that a combination of factors has come together to act to reduce timetable resilience.

Firstly these affect Right Time Arrivals, but they also impact on PPM performance too. This happens because:

- trains which lose odd minutes due to various small causes can find these adding together to cause a train to arrive five minutes or more late, thus failing PPM but without any attributed delay occurring
- Trains running a couple of minutes late due to small causes are then affected by a bigger, attributed delay which is sufficient to push them over the five minutes late threshold and thus become a PPM failure.

There are various observable changes in the way that the system is being operated that are coming together to impact timetable resilience. The principal changes we believe are set out in the sub-sections which follow.

Committed Obligations addressing timetable operability

CO51.3d – SWR are required to undertake timetable performance simulations 2 months prior to the commencement of each WTT between December 2018 and December 2020. The purpose is to validate the timetable offered and identify any lessons which can be implemented in the operation of the timetable or incorporated into the development of the following timetable.

6.1 Increasing passenger loadings over time have put dwell times under pressure.

Passenger volumes increased substantially over the last ten years or so, and quickly put dwell times under pressure, especially in the suburban areas and at key interchange stations such as Wimbledon, Clapham Junction and Vauxhall. SWT reacted to this by strengthening station staffing, tightening up on train despatch routines, and through by the 455 refurbishment programme which created stand-back areas around the doorways to improve passenger access and egress. Lengthening firstly the Windsor Lines services to

10 cars, and then the Main Suburban services similarly, has improved carrying capacity but also created additional problems with timely train despatch due to longer trains, platform curvature etc. Dwell times often exceed the planned allowances at key stations in the high peak, but there is little more that can be done in advance of the new Class 701 trains being delivered and the change in the method of door operation that they should bring with them. One shorter term possible improvement would be to review the positioning of guards' CCTV monitors (provided at key stations to assist them with despatch, as these have not been adjusted to reflect the move to 10-car operation. Another possible course of action would be to standardise the riding position of guards in each length of train formation at the critical stations. This would enable the station staff to know where the guard is going to be at each stop and position themselves accordingly.

It will be very important to ensure that driver control of doors (known as DCO) is achieved as currently intended when the Class 701 fleet is introduced into service. This offers an important opportunity to reduce dwell times.

Committed Obligations addressing dwell time;

CO21.1 - deliver actual stations dwell times of no more than 30 seconds at stations served by Class 701 trains, with 45 seconds allowed at 15 named stations and 60 seconds allowed at Staines.

CO21.4 - expenditure at Vauxhall (Main sub) and Clapham Junction (main sub and Up Windsor) stations to raise and provide canopies on specified platforms to encourage passengers to use more of the platforms.

CO22 - creation of a fund to improve enhanced operational efficiency at nominated stations.

CO24 – Installation of ASDO balises between Waterloo and Guildford via Cobham

CO27 – removal of 1st class offering on the Main Suburban and Windsor lines, requiring declassification of Cl45 and 458 fleets when on these services to increase train capacity.

CO51 requires SWR to introduce a short-formation reporting tool to report occurrences of unplanned short-formations in passenger service.

Recommendation 10: SWR should review the provision and location of CCTV monitors on station platforms to assist guards with dispatching trains

Recommendation 11: SWR should consider standardising the riding position of guards for each length of train formation at stations between Raynes Park/Barnes and London Waterloo

Recommendation 12: SWR should seek to achieve the maximum extent of DCO possible on its routes.

The Main Suburban service on the Up and Down Main Slow lines is planned at a peak frequency of 18 trains per hour. Effectively this means that the time taken between one train starting to pull away from a station and the next one doing the same must not be more than three minutes. With a two minute signalling headway this means a maximum dwell time of 60 seconds must be achieved for every train through the high peak. Our observations show that this is not routinely being achieved and hence some loss of timetable resilience occurs. One possible solution to this would be the provision of 'closing up signals' at Wimbledon, Earlsfield, Clapham Junction and Vauxhall. These would permit trains to safely follow each other more closely and could reduce the signalling headway by perhaps the 15 or 20 seconds necessary to make the difference. However, this is not a cheap solution as it would involve an expensive signalling intervention, and neither would it be feasible to achieve this in the short term. However, if a high-performing railway is what we aspire to have on this Route, then this is a scheme which deserves to be investigated in more detail.

Committed Obligations addressing right time running in the peaks

CO54.5 – Implementation of a CDAS system at Berrylands Junctions (and two further locations to be identified) to improve right time presentation at key locations

Recommendation 13: NR should consider the provision of closing up signals both the Up and Down Main Slow line platforms at Wimbledon, Earlsfield, Clapham Junction and Vauxhall

6.2 A progressive increase in the impact of defensive driving behaviour.

The current SWR Professional Driving Policy was introduced by SWT in 2012, although the genesis of 'defensive driving' as a philosophy to reduce the risk of SPADs, TPWS interventions and station overruns predates this by a number of years. The policy in use

is broadly similar to those in use at other Train Operating Companies (TOCs) around the country.

Essentially the guidance given to train drivers now is to drive more cautiously once sighting a restrictive signal aspect, and before the normal braking point as designed in the signalling scheme design. Drivers are also advised to reduce speed to 20mph by the platform ramp end when approaching a station with a red signal at the end of the platform, and to further reduce this to 15mph by the time the AWS magnet is passed. In addition, drivers must ensure that they are not exceeding the intervention speed when passing over any Train Protection and Warning System (TPWS) Over-Speed Sensor (OSS), and these intervention speeds are again set cautiously for the planned braking curve as set in the original signalling scheme design. Drivers must also ensure they do not exceed 10mph over the TPWS OSS positioned along the platforms on the approach to any buffer stops. Finally, drivers are advised to approach any red signal very cautiously, to stop ahead of it and proceed at walking pace towards it if necessary to 'close up'.

These measures are designed to reduce the risks to operational safety, and are taught on initial driving training and reinforced on drivers' six monthly off-track briefing days and in biennial assessments including on simulators. As the years have passed, the proportion of drivers in the system who were trained and experienced before this regime was introduced has steadily reduced through natural wastage, and thus the proportion of drivers who exactly follow the preferred method of driving has gradually increased. Whilst the impact on individual trains of this policy may be minimal, its collective impact can be sufficient to cause time in schedules to be lost, which then builds up with consecutive closely spaced trains as we have in the high peak. There have been no adjustments to train planning rules or sectional running times to reflect the implementation of this policy.

In addition, there can be a specific impact of drivers stopping their trains a little short of a red signal depending on location. One such signal is W6 signal on the Up Main Relief line immediately outside Waterloo station: unless the driver of a 12-car formation train pulls up close to this signal when it is showing red it prevents the train from clearing the track circuit behind it which locks the points at West Crossings; the effect of this is to prevent a route being set for the following train to the Up Main Fast line. The timetable requires such moves in both peak periods to allow two simultaneous arrivals from the Main line service group into Waterloo. Only with such moves is it possible to route 24 trains in and out of the station in the high peak hour, which is what the train plan requires. It only

needs one driver in this sequence to stop his train a little short for every subsequent train in the high peak to be delayed, and the parallel moves in the throat at Waterloo to be inhibited. We have observed just this situation occurring during this review, and on its own it can be enough to cause a number of trains to fail PPM.

Given the undoubted improvement in safety that TPWS and the application of professional driving policies have had over the last 15 years or so, it would be extremely challenging to try and make any policy changes in this area. All the more so given the more recent upturn in station overruns and TPWS OSS activations. Instead, efforts should be made through briefing to ensure all drivers are aware of the need to draw up appropriately when approaching the handful of such critical signals when they are displaying a red aspect.

Recommendation 14: SWR should consider amending the professional driving policy such that drivers understand the need to draw up appropriately when approaching key signals in the throat outside Waterloo station when they are displaying red aspects.

6.3 Shortage of fully trained drivers combined with operational complexity of train crew diagrams leading to lack of resourcing resilience and heavy dependence on free day working.

At the time of this review there was a considerable delta, especially at Waterloo depot, between the required extent of route and traction knowledge to be compliant with the base diagrams and the actual position. This deficit required over 1400 training days to recover.

This deficit puts strain onto the day to day diagramming and rostering activities required to apply driver to the daily timetable, with rest day working, swaps of driving turns and diagram splitting (where diagrams are split between a number of drivers on a day) with each mitigation applied being a potential source of operational failure. In disruption the effort required to keep track of resources in these circumstances is considerable, and with variation in the capabilities of drivers within links or depots it is not possible to implement a consistent degraded or service recovery plan during or after disruption, every train service management decision becoming ‘subject to traincrew’.

This is an area that we consider requires a specific and more detailed review. We have tackled this in Section 10.2.

6.4 Serious loss of operational expertise and command and control capability in Control function before and after the move to Basingstoke

The move of the Wessex Integrated Control Centre from the raft at Waterloo station to Basingstoke Regional Operations Centre (ROC) took place in April 2017. At the time it was intended to co-locate it with signal control workstations for re-signalled bits of the network, and with the Electrical Control Room. Neither of these latter features have occurred to date, yet there have been a series of highly adverse consequences arising from the move.

Whilst the facilities for controllers are support staff are very much better than they were at Waterloo, and the move has enabled NR to move its management and support team, as well as its training centre, onto the same site as its Control organisation, the location has proved to be very unsatisfactory in a number of ways. This is explored in more detail in Section 7, but there have perhaps been three significant dis-benefits from the move which have significantly impacted on timetable resilience since:

- A severe loss of expertise in controllers, caused by many time-served controllers choosing to either retire or seek work elsewhere, because the location at Basingstoke was unsatisfactory for them. This caused a loss of capability in the year or two before the move, whilst it was being planned, but then a collapse in ability at the point of transfer. [redacted]
- Breaking the physical colocation of train service controllers and resource managers, requiring the very close inter-working required between them to be done exclusively by phone rather than face to face and by the use of 'controller's ear'
- Remoteness of the SWR Controller team from their own management team at Friars Bridge Court. It is no longer easy for senior managers to 'pop in' to the

> Control as it necessitates a round trip of about two and a half hours before any contact time. Inevitably this has increased to sense of remoteness of the affected groups of staff and has inhibited the effectiveness of senior managers to remain close to their key staff running the train service on their behalf[13].

We assess the combined impact of these features on the core resilience of the timetable to be very significant. Recommendations to address this are included in Section 7.

6.5 Increase in various train lengths over time from 8 to 10 and 12 cars, meaning that junctions take longer to clear and trains approach platform ends slower

Over the last several years there has been a progressive increase in the number of Main Line trains operating at the maximum possible length of 12-cars (of 20m long vehicles; 10-cars of 23m long vehicles). Over the last three years there has been a conversion of the Suburban networks to 10-car operation, firstly on the Windsor Inner service group, and then most recently on the Windsor Outer and Main Suburban service groups.

There are a number of operational consequences of this, one of the main ones being that longer trains take correspondingly longer to clear key junctions in order to permit following movements to be made. The effect has been that for almost two thirds of trains going in and out of Waterloo the time to make movements over junctions has increased by roundly 25%.

Once again, this has not been reflected in the junction margins applied in the Train Planning Rules, and hence this is another factor that has acted to reduce the resilience of the timetable.

Committed Obligations addressing right time running in the peaks;

CO54.5 – Implementation of a CDAS system at Berrylands Junctions (and two further locations to be identified) to improve right time presentation at key locations

[13] We note that SWR has taken steps to strengthen its managerial capacity at the Basingstoke ROC whilst this review has been underway.

In addition, the Class 707 fleet has introduced a further complexity to the operation of the system, in that there is yet another type of fleet operating on the network requiring full maintenance facilities within the existing depot spaces, considerable volume of traction training, and more opportunity for things to go wrong during disruption.

Furthermore the introduction of Automatic Selective Door Opening (ASDO) on the rear doors of multiple unit trains requires an increase in the accuracy of stopping in platforms. The system used is based on GPS and ground-based balises. If this detects that the train is not quite in the correct location the ASDO will not operate, requiring the driver to manually override it. It is suggested that this system has inadvertently caused a more cautious approach to those station platforms which require the use of ASDO, increasing time taken to make the station stop, along with the potential for manual override of the doors adding to the dwell time taken; the cautious approach being to mitigate the need for manual override. Over successive stations this may well be a cause of the small but consistent loss of running seen, especially if incurred at stations with planned 30 second dwell times.

6.6 Loss of flexibility and lower capability of track and signalling at Waterloo installed during the South West Capacity Upgrade in 2017.

The revised track layout and signalling system installed at Waterloo during the South West Capacity upgrade has led to some significant reductions in flexibility which are impacting negatively on timetable resilience:

- The movement of crossovers on the Main Suburban lines further out in the throat, coupled with the removal of the former scissors crossover and its replacement by two conventional turnouts, has led to slower reoccupation times for all movements to and from Platforms 1 to 4. Reoccupation time for Platform 1 is significantly longer.
- There has been a loss of access from the Up Main Slow line to Platform 7, moderated by new access to and from Platform 4 to the Main Fast lines
- Inability to set a parallel route out or Platform 3 or into Platform 4 whilst a route is set out of either Platforms 5 or 6
- Reduction in Waterloo South Sidings capacity from two double-ended 8-car sidings to one single-ended 10-car siding

- Inability to set a route from the Windsor Reversible line via Windsor Reversible 2 line into Platforms 21,21 and 22 without trains being brought to a stand at the intermediate signal and waiting for a time out to clear
- Inability to set a route from the Up Windsor line via Windsor Reversible 1 line into any of Platforms 20-24 without trains being brought to a stand at the intermediate signal and waiting for a time out to clear.

6.6.1 Main Fast and Main Suburban Lines

The first three bullet points listed above were obviously known about when the layout was being designed and were subject at that time to considerable evaluation during option development. The result of this work was that it was considered that the agreed revised layout would be compliant with the Timetable Planning Rules as they existed at the time, although it was recognised that re-occupation time for Platform 1 would be longer than beforehand.

Whatever the merits of this analysis, it is clear from observation that the revised layout installed in August 2017 has in practice slowed down the operation of the Main Suburban part of the station, and acted to reduce the inherent resilience of the timetable.

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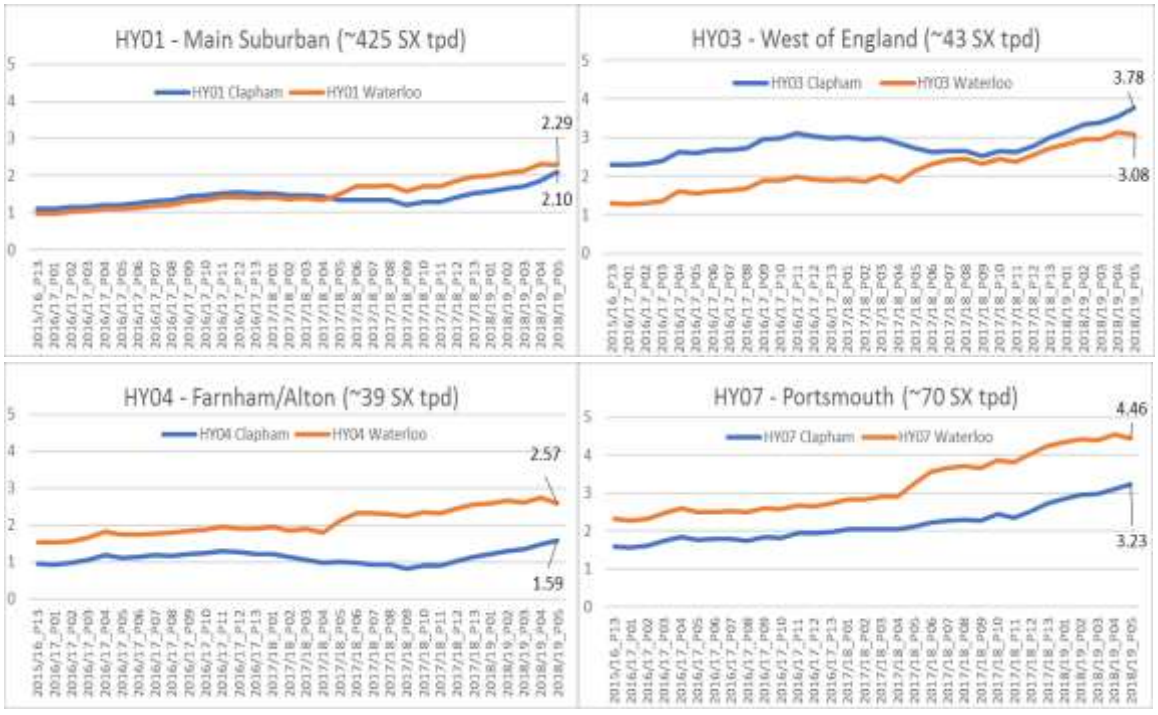
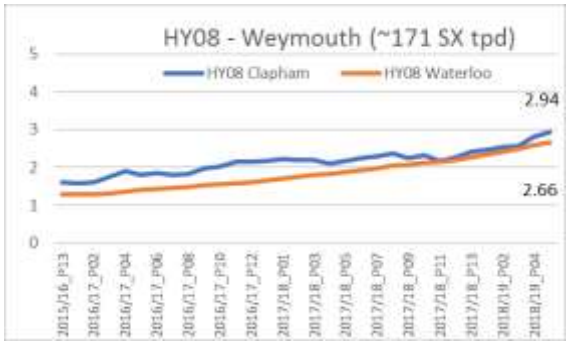
Our observations have been validated by analysis of Average Lateness by service group for Waterloo bound trains, measured on arrival at or passing Clapham Junction (orange line) and on arrival at Waterloo (blue line). All service groups using the Mainline and Main Suburban Line show a significant deterioration in Average Lateness from Period 5 of 2017/18 onwards. Initially this was due to the impact of the Waterloo blockade but it has carried on getting worse since the new layout was brought into use.





Most notable is the change in the Main Suburban service group which went from having a lower Average Lateness at Waterloo prior to the rebuild (suggesting an element of recovery in the timetable) to a higher Average Lateness and this may then have been exacerbated by the commencement of 10-car operation in December 2017 from which point both Average Lateness lines deteriorate significantly.

6.6.2 Windsor Lines

In contrast to the above picture on the mainlines, the same assessment of Average Lateness on the two service groups on the Windsor Lines shows a different picture in which Average Lateness is lower in absolute terms, was not materially affected by the Waterloo blockade, and has been more consistent in the longer run.

The changes in the last two bullet points in section 6.6 above came about as a result of detailed signalling scheme design, and were not anticipated when the layout was conceived. They proved necessary to enable standard signalling principles regarding overlaps to be complied with.

The result of this been to extend running times into the former International Terminal and to restrict when routes can be set out of it. It also results in trains routinely being brought to a stand at red signals on the approach to the terminal which is an unsatisfactory practice. Whilst this has not been a material problem since the blockade, it is likely to become much more of one once platforms 21 to 24 are reopened for regular use.

There are possible ways to ameliorate the impact of these changes. In respect of the routes into and out of Platforms 20 to 24 it may be possible to secure derogations from the relevant standards, or else there may be alternative technical solutions to be explored.

In respect of the Main Suburban issue, there is the possibility of uprating the permanent speed limit through the layout from 15mph to 20mph. The track was designed for 20mph (as indeed it is on the International Terminal side), but de-rated to 15mph at the signalling design stage because of concerns from SWT's Operations Standards team regarding having differential speed restrictions across the layout at Waterloo. We believe that

concerns over a single permanent speed restriction across the layout can be overcome, so the issue becomes one of the costs of retrospectively adjusting the signalling design to permit a higher speed plus the ongoing incremental maintenance costs of a slightly higher speed layout.

Our view is that the benefits of uprating the Permanent Speed Restriction to and from the Up and Down Main Slow lines and to and from the International Terminal platforms to 20mph would provide a significant operability improvement to the entire station working, and go some way to mitigating the impacts of reduced timetable resilience we have outlined in this section.

6.7 Introduction of 10 car working on Suburban routes resulting in loss of flexibility in perturbation

The introduction of 10-car working on the Main Suburban service group has had a negative impact on the operability of the system, and which does not appear to have been properly considered at the planning stage. By way of example, the bay platform at Kingston only has space for trains of no more than 8-cars, and whilst it is possible to turn trains round in the Down Kingston platform this requires immediate turn around in order that the line is not blocked. Access to the bay platform was a particularly useful facility to have during any perturbation on the Main Suburban network. Thus it is now much harder to confine disruption to either the Windsor Lines or the Main Suburban. A knock on impact is that services from the Epsom corridor now have to be reduced more harshly when it is necessary to ration the number of Main Suburban trains running into the Raynes Park to Waterloo corridor. Currently it is not possible to turn passenger trains back at Raynes Park when coming from the Epsom direction.

Committed Obligations addressing infrastructure deficiency and/or capability

CO24 – SWR to establish an Infrastructure Feasibility and Implementation Fund to facilitate potential capacity and line enhancements

6.8 Insufficient stabling facilities following introduction of Class 707 fleet and operation of longer peak services

The addition to the fleet of 30 5-car Class 707 units has come with insufficient additional siding space, especially in the London area. Some sidings, previously capable of holding 12-car trains, are now needing to be used to accommodate 10-car trains which cannot fit in sidings which are restricted to 8-car lengths. This has led to an additional 10 daily weekday driver diagrams to allow for stock movement (meaning an uplift in driver numbers of 15), and difficulty during disruption to find suitable stabling points to clear trains from the running lines. This situation will prevail until the new stabling sidings at Feltham become available. In recent years Staines sidings have not been staffed during the day and so are not available to be used. This creates unnecessary problems with stabling units between the peaks, especially during perturbation.

In addition, stabling planned for the introduction of additional 10 and 12 car operations in December 2017 within the legacy fleets has largely not yet been delivered (i.e. Woking, Fratton and Basingstoke). As a temporary measure additional ECS mileage is being incurred to berth units during the off-peak, and overnight more stabling is occurring at stations. This is affecting unit maintenance and servicing planning as fitters are now having to access units in stations to rectify defects. This has a consequential impact on the productivity of fitting staff from having to travel to the trains rather than the trains coming back to depot/stabling locations.

6.9 A prolonged and ongoing industrial dispute causing diversion of managerial effort and loss of cooperation amongst some members of train crew.

There are two consequences for performance arising from the ongoing industrial dispute affecting guards.

- Managers are significantly distracted through a range of tasks including training contingency guards, planning, communicating and executing amended services, and attempting to negotiate a settlement to the dispute. This removes much of the time that might otherwise have be available to address performance problems on the network. Thus, despite the obvious need to focus efforts on arresting and reversing the decline, this need is frustrated by more pressing tasks.
- Individual members of train crew who are either in dispute already, or sympathetic to the guards' cause, may be less motivated to go the extra mile to maintain or recover performance during or after disruption.

6.10 Too many Temporary and Emergency Speed Restrictions on the network.

In recent years there has been an increase in the number of unplanned TSRs and ESRs. In the early days of the Railtrack era the target for these on what is now the Wessex Route was set at zero, and was closely monitored to ensure that when ESRs or TSRs were instigated there was a plan quickly developed to have them removed quickly, with the plan tracked weekly.

The reason this is so important is because of the intensity with which the network is operated. There are no engineering allowances on the former Southern Region, as there are on all other NR Routes. Instead, all point-to-point timings contain a 5% allowance to allow for fluctuations in the DC power supply, and for normal variations in traction and driving performance. This allowance has effectively already been consumed by amended driving practices introduced following the installation of TPWS OSSs and professional driving policies.

Following the Hatfield derailment in 2000, which exposed the growth of rolling contact fatigue as more modern traction types were introduced, Railtrack imposed many thousands of unplanned TSRs and embarked on a major programme of re-railing. Whilst TSR numbers were eventually brought back under control, NR has never since managed to regain the position where zero ESRs and unplanned TSRs are seen as an achievable goal. Rather, the existence of large number of these has become normalised within the organisation.

In recent times the Wessex Route has been averaging somewhere between 30 and 35 ESRs and unplanned TSRs in place at any time. Of course, the location and severity, and therefore the impact of these varies greatly from the minimal to the very significant indeed. Recently these numbers have increased and (at the time of writing[14]) there are a total of 62 speed restrictions in place on the Wessex Route, split 45 ESRs and 17 TSRs. Of this total 14 are differential speed restrictions where only freight trains are directly affected (passenger trains may suffer reactionary delays of course). Between 18 and 38[15] of the remaining 48 live restrictions can be expected to create direct delay to passenger trains, some much more than others. Of the 62 existing restrictions, 11 currently have no planned removal date shown for them, some planned removal dates have passed without the remedial work having been completed as planned, and some of the dated planned removals are as far away as 2020[16].

The timetable cannot be expected to work properly when there are speed restrictions in place which routinely delay trains by a minute or more. Neither can it cope with any severe speed restrictions at all on an intensively worked section of track.

Earlier this summer we saw consecutive severe speed restrictions on the Main Line between Basingstoke and Bournemouth. When three or more of these are in the same direction, as has happened recently, trains are highly likely to fail PPM. Even one severe speed restriction will mean trains routinely approaching key junctions late: a 20mph TSR on the Up Line departing Guildford recently led to every train for several weeks approaching the critical junction at Woking around 2 minutes late. This is guaranteed to spread delays across the network.

There are currently 50mph ESRs on both the Up and Down Main Fast lines at Weybridge, where the line speed is 90mph and is used by a minimum of 12 express passenger trains per hour per direction in the off peak alone, with more in the peaks. Each train incurs a delay of around 45-50 seconds. They have been there in their current form since January.

[14] 31st August 2018
[15] A matter of judgement depending on their severity and precise location relative to stations etc
[16] This is a fluid position, changing day by day, and this data has changed quite a bit during the edit phase of this report.

The reason the ESRs are in place is a longstanding difficulty with maintaining adequate formation for high speed over a facing crossover. Many attempts have been made to fix this problem over several years, but none of them have proved to be anything more than short term stop gaps. In the view of NR's Head of Maintenance, this crossover is unmaintainable for the existing linespeed. However, there is as yet no alternative approach in development to deal with the problem properly. A permanent solution is likely to involve some form of S&C renewal, and will thus be expensive and take time to plan. But a budget has not been identified and so the problem has been left to persist week after week[17].

Because the delay suffered by each train is usually less than one minute, and it is on a four track section, the delay is not 'networked' in TRUST-DA and so is not captured as a cause of delay. But the impact of eating into timetable resilience occurs all day every day. Here are two examples of the impact this can have:

- Trains already running perhaps a minute late will arrive at the next key junction perhaps two minutes late, and thus be out of path and delay other trains in turn. In the case of the example quoted, this tends to affect the joining sequence at Berrylands Junction in the Up direction, and crossing moves at Woking or Woking Junction in the Down direction.
- Trains which might have arrived four minutes late at destination instead arrive five minutes late and just fail PPM; there is also one minute less to achieve a punctual turnround for the next service to start on time.

This situation will prevail until such time that NR is able to remove these speed restrictions and prevent new ones from arising. These restrictions are most often caused by poor quality track condition, but sometimes by poor condition of structures or earthworks, and occasionally are imposed for sightline deficiencies at user-worked or pedestrian level crossings. Of course, the existence of speed restrictions in this quantity is an indicator of a wider problem relating to the adequacy of maintenance and renewals on the

[17] During the course of this review NR has developed a proposal for this location, but at the time of writing it is not yet funded

infrastructure, which we address in Section 8. In the meantime, a much stronger focus is required to tackle TSRs and ESRs which daily erode timetable resilience.

NR has provided incremental funding this year to its Wessex Route with which it has created additional temporary teams whose role is to tackle the TSR/ESR problem. However, it would appear that even with this additional resource the Route is struggling to get on top of the issue. A long spell of hot weather this summer has undoubtedly created additional strain on the Permanent Way teams. It will be important that this level of increased resource is further augmented and sustained for the foreseeable future.

Committed Obligations assisting ESR & TSR management

CO45 – installation of operational track monitoring equipment to 125 vehicles across 5 rolling stock fleets to provide real time data on track condition to Network Rail

6.11 Other considerations

The consequence of all these issues, taken collectively, is to make the timetable that small bit less reliable in any given set of circumstances. This is sufficient to degrade punctuality on any given day by maybe between 1 and 3 percentage points, although for obvious reasons it is difficult to quantify this. Unfortunately, it is not possible to relax train running schedules any further at the key points on the network without loss of train capacity, and any loss of train capacity would result in increased overcrowding leading to greater dwell time exceedances, thus making any re-timing exercise counter-productive.

The recommendations made in the body of this section, if carried through, are considered to result in partial mitigation of this problem of reduced timetable resilience. We do not consider it possible, within the constraints of the railway infrastructure and operational practices as they exist today, to restore the level of core timetable resilience seen in the years after the current timetable structure was introduced in 2004, unless fewer trains are run at peak times. We do not believe it would be either sensible or acceptable to reduce the peak train service specification, for the reasons given above.

This means that the only way to restore a 2004 level of core resilience in the timetable is to introduce a number of infrastructure improvement schemes designed to improve the

operability of the network. The following table is a short list of track layout and signalling revisions which would provide increased resilience in the timetable, although it should be noted that many of these would also improve capacity and thus allow additional trains to run.

Location	What	Why
Woking Junction	Construct flyover from Up Portsmouth line to between Up Slow and Up Fast lines	This initiative is currently planned for CP6 as a capacity enhancement scheme. However, it would also have a significant performance improving impact
Salisbury – plat 1,2 & depot entrance	This initiative would install main aspect signals at both ends of platform 1, from platform 5 and install a cross over at the London end of the station from DM to UM and a west end entrance to the Depot. The operational improvements are that platform 1 can be used for passenger trains, platforms 1 and 2 becomes reversible, Salisbury depot is accessible from the west, as can be platform 5 for passenger services.	There is a major splitting/joining operation at Salisbury throughout the day. The shunts and unit stabling in platforms take up considerable capacity. The considerable shunts are a cost in driver resource as well as Salisbury depot being full and the surrounding sidings are equally full. This is high risk as trains are often stabled on the entrance road. This initiative is capacity enhancing and performance risk mitigating. The west end depot exit/entrance enables all west ECS moves to totally avoid the station and enable the Southampton to Salisbury services to be extended to Swindon.
Bracknell Turnback – putting the manual crossover into the signalling system	This initiative would take the crossover on the London side of Bracknell and connect it to the main signalling system at Feltham. It would install a new turn back main aspect signal in the London direction on the down platform with a corresponding shunt signal in the down direction on the up line.	1. Creates ability to serve Bracknell to Reading in the event of disruption east of Bracknell. 2. In the event of 4tph London to Reading not being achievable, it will permit a Bracknell to Reading shuttle, offering 4tph Reading to Bracknell. 3. In the event of engineering works west of Bracknell, i.e. Wokingham Junction, Bracknell could be served from the London direction. Bracknell to Reading is the second-highest out of London passenger flow.
Fareham – middle bay platform to be made through platform	This initiative would re-connect the bay platform at the east end in the Portsmouth direction to enable it to be a through platform with the associated signalling changes.	Fareham can become congested, especially when there are delays on the single line towards Eastleigh. The initiative would enable an additional through platform that will mitigate delays as well and more robustly enable an additional Southampton to Portsmouth service.
Feltham Sig F456 – signal converted to main aspect	This initiative converts the current shunt signal at the London end of the down platform to a main aspect signal with the associated cross over.	It will enable Reading bound trains to reverse in the London bound direction enabling robust contingency plans as well as efficient services during engineering work.
Clapham Junction – Platform 7 faster turn in to remove approach control	This initiative would undertake some civils work to increase the turn in to the up fast Clapham Loop (Platform 7) and making the up signals 'flashing yellows'	This initiative will increase capacity by enabling a faster entry into platform 7 and will enable more trains to stop at Clapham Junction by avoiding the need for approach controlled signalling
Vauxhall Platform 1 – signalling enhancement to turnback	This initiative would amend the signalling to enable trains to reverse at Vauxhall (Platform1).	This would be particularly useful in the event of a Waterloo closure whether planned or otherwise so trains can terminate and turnback at Vauxhall, recognising the considerable connectivity with buses and the Victoria Line
Clapham Yard – signalling enhancement to operate from plat 7 to up Windsor lines	This initiative would amend signalling in Clapham yard to enable passenger trains to pass through from Platform 7 to the up Windsor lines.	This would be particularly valuable during major engineering works between Waterloo and Queenstown Rd whereby train services could be potentially be doubled and run more reliably, because the single lead Queenstown Rd crossover could be used in the down direction only.

In addition, acceleration is impacted by power supply constraints, especially on the Portsmouth Direct line. Schemes could be developed to improve the capacity of the power supply with the aim of improving core timetable resilience.

7. Control and resourcing structures

In this Section we assess the ability of the Control and Resourcing structures in place to manage disruption and achieve service recovery after disruption. This includes response capability on the ground as well as the resource situated within the Control and Resourcing structures themselves.

7.1 Control

The SWR control organisation is integrated with the Network Rail Wessex Route Control and based at the Basingstoke Campus (ROC). The integrated Control as a concept dates back to 2007 and the Wessex Route/SWT had in place an integrated control – the Wessex Integrated Control Centre (WICC) - since around that time, albeit based at Waterloo Station. The basis of integration is that

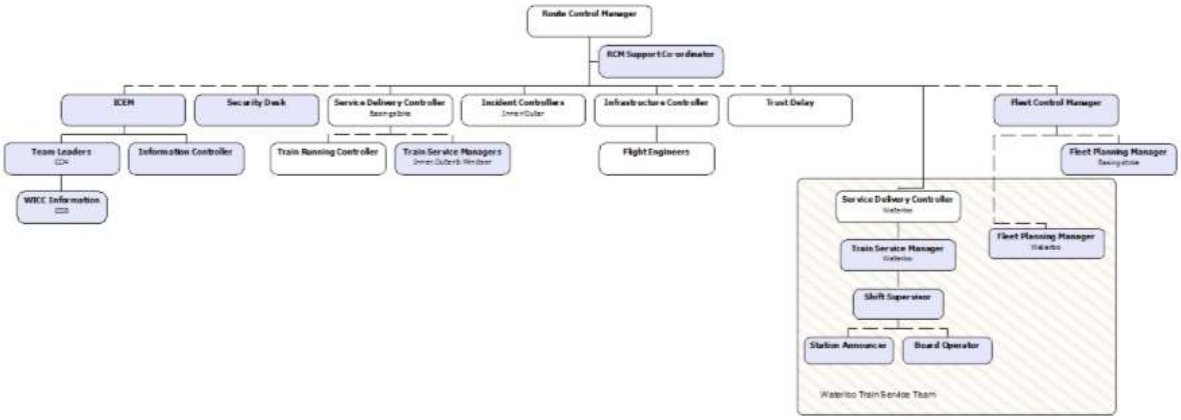
(a) there is a single guiding mind ultimately responsible for all control activities and decisions on the route (the RCM), and that

(b) there is no need to duplicate roles and activities as is the case in the more traditional (post-privatisation) Route controls in the UK;

Its aim is to make decision making and communication more effective and thus improve Control outputs and therefore deliver better incident management and service recovery. In practice, the model places more responsibility on NR to lead incident and train service management, with the TOC being the enabler of the required train service intervention. This structure can lead towards the disenfranchisement of the TOC in the train service management process.

From a service and incident management perspective SWR has only two roles within the core of the Control structure, these are the Train Services Managers (TSMs) and the Fleet Control Manager (drivers' technical assistance). All other train service and incident management roles such as the Route Control Manager (RCM), Service Delivery Controller (SDC), Incident Controllers (IC), Infrastructure Controller (IfC) and Train Running Controllers (TRCs) are NR roles. SWR does also have a team of staff delivering customer messaging/communication under the Information & Customer Experience Manager based in the ROC but this is a downstream activity. As per the core principles of an Integrated Control SWR does not have a Duty Manager within the Control, the

responsibilities of such a role being vested in the RCM; this is a relatively unusual situation within GB rail.



The SWR TSMs at Basingstoke ROC are line managed by a day-shift manager (who is the most senior SWR manager based at the ROC) but for the purposes of day to day activities the TSM role reports (as per this diagram) to the NR SDC. However, it has been noted that they often in practice work to the NR TRC and as a consequence, the key SWR control post is effectively in the fourth tier of the control structure (RCM>SDC>TRC>TSM). There are 3 TSMs covering the SWR operation with area split geographically into Inner, Outer (mainlines) and Windsor.

The SDC role is a relatively new post to the control organisation having only fully gone live in early 2018. This is a Controller 1 post which is focused solely on the strategic management of the SWR train service during disruption and has been inserted to take pressure off the RCM (allowing a more strategic overview) and the TSMs (who can focus on tactical implementation of service recovery/train service interventions); this is a role that in any other non-integrated TOC control would be undertaken by a TOC Senior Train Service Controller/Service Delivery Manager type role. A further additional NR role of Incident Officer has been added to the organisation in recent months – this is an HQ mandated role, based upon London Underground practice of having a senior manager on shift 24/7 to act as the gold commander in the event of any major incidents occurring. It is early days for the role, but there do appear to be some issues with the integration of this role into the day to day operating practices of the Control, given that it sits outside the line management (and pay) structure for the control.

An unusual element of the SWR, and indeed NR, Control organisation is that it is split over two sites. In addition to Basingstoke, there is a satellite control remaining at Waterloo which contains a NR SDC and an additional SWR TSM overseeing station control duties. The retention of this capability at Waterloo was a function of the need to control the amended train service operating during the Waterloo blockade of 2017, but has since become a permanent fixture. In terms of role demarcation between Basingstoke and Waterloo, the accepted definition is that the team at Waterloo are responsible for amending and resourcing the outbound train service from Waterloo as far as Vauxhall, working to the instructions received from Basingstoke.

The WICC only moved from Waterloo to Basingstoke in April 2017; a move undertaken as part of the NR Network Operating Strategy programme in CP5 for which the planning for, and notification of, the move started some years before hand. The move to Basingstoke is an interesting one. Basingstoke is not a 'traditional railway town' and so does not have an established pool of railway expertise, but the choice of such a location was no doubt informed by the perceived benefits of breaking from a long-standing railway location and the opportunity for cultural change that would arise. For SWR the move has proved highly problematic: many of the experienced TSMs based at Waterloo chose not to move to Basingstoke due to the additional travelling time and costs and indeed a number moved to new roles with other companies or retired prior to the move creating a recruitment problem at both Waterloo in the short term pending the move, and Basingstoke in the longer term (this has also affected NR but not so significantly).

It has been noted that turnover within the TSM role in the last 3 years has been very high, and since moving to Basingstoke continues to be so, and consequently the average length of railway service for a TSM has plummeted to only a few years[18]. This results in quite serious issues of limited knowledge and experience, whereby the innate understanding of a train service of the scale of South Western which underpins a controller's response to disruption is lacking. In some cases, TSMs have been recruited 'off the street', and whilst this in itself is not a bad thing as it introduces experiential diversity into the control,

[18] Exact data on average length of service has not been provided, but this has been notified as a fact sufficiently frequently for us to be able to rely upon it.

it does require the training and competence assessment processes for new controllers to be of the very highest quality; it is not clear that this is the case. It is also not clear that SWR have in place an effective lessons learned/capability development process for controllers in the way that NR is able to demonstrate for its staff. Furthermore, the flat and limited SWR organisation within the ROC means that career progression for SWR controllers can only be to either move to an NR role (leaving SWR) or to leave the WICC (remain with SWR). [redacted]

We have observed during the period of our review a number of adverse consequences from the loss of expertise evident amongst the TSMs. A particular example is the increased use of skip-stopping as a mechanism to try and restore punctual running as quickly as possible. Whilst this is a perfectly valid technique to prevent late running of a particular train from infecting many more later trains, and thereby minimise overall passenger dis-benefit, if applied mechanistically or without regard for service patterns around the affected train, it can cause disproportionate impact on passengers wishing to use stations which are skip-stopped.

For SWR the move of the control has divorced the control from the rest of the SWR HQ organisation (itself split over two locations in London) and consequently the SWR control is infrequently visited by the SWR senior management team nor afforded any back-office or senior leadership support on-site during disruption as might be the case if located with the HQ. This is not an issue that NR has suffered from, as the Campus serves as the Wessex Route headquarters. There is a palpable feeling within the SWR team, and amongst staff remaining at Waterloo, that the SWR control team have been physically separated from the main organisation for no obvious benefit to SWR.

We also note that, whilst the move to Basingstoke was undertaken as part of the Network Operating Strategy that sought to co-locate Signalling, Control and Electrical Controls ahead of eventual integration, only the Control element has so far moved to the ROC/Campus and only very limited amounts of signalling will move in during CP6. Even then, signalling operations are planned to be on a different floor, vastly reducing the benefits arising from co-location.

SWR have instigated a programme to investigate and recommend potential changes to the capability of the SWR (and NR) control operation in order that the elements of the Franchise Delivery Plan relating to the control can be fully exploited. This work is ongoing at the current time and a 'Control Vision and Strategy' has been produced; to a degree this is based upon the elements of the delivery plan and although it does recognise a number of the failings with the current set up it does not propose any significant change to the underlying structure of the SWR/Wessex control.

7.2 Train crew resource management

The train crew resource management organisation that SWR inherited is a joint rostering and resource management team that both plans the forward rosters and manages the allocation of train crew to trains during disruption. There are two resource centres, one at Southampton looking after the 'outer' train crew depots, and Waterloo looking after the 'inner' train crew depots. The Waterloo team are co-located with the Waterloo based SDC/TSM and Station Control team in the old WICC offices. Prior to the move to the ROC the Waterloo based resource team were co-located with the Integrated Control and had direct access to the SWT TSMs, although this has never been the case for the Southampton team.

The resource teams themselves have undergone a great deal of change over the last 10 years. SWT withdrew with the TCS (Train Crew Supervisor) organisation by late 2007; within this set-up train crew management was undertaken from eight separate locations and was an organisational structure inherited from pre-privatisation days. The replacement organisation, utilising the Operations Resource Manager role, was designed to 'professionalise' the management of train crew and introduce management responsibilities and was delivered alongside a further reduction in the number of locations to five. More recently a further revision to the current organisation took place in 2014. This introduced the Duty Resource Manager role responsible for on the day resource management, and Senior Resource Managers who, along with a rostering team, planned train crew rosters in advance. It has been suggested to us that the current organisation is the most effective resource management structure that has been in place, with more resources available to plan and manage train crew than before and better span of control facilitating more consistent train crew rostering practices across the whole operation.

Committed Obligations addressing traincrew resource management

CO26 – Implementation of a traincrew rostering system to reduce rostering errors, improve spare cover, implement self-service booking for leave, provide depot availability and productivity data. Train crew line manager training in negotiating, health & Safety and discipline and grievance processes.

7.3 Rolling Stock Resource Management

Rolling stock resource management is the responsibility of two Fleet Planning Managers (FPM) one who looks after the Desiro fleet (Class 450/444) and one who looks after all other fleets. Their role is to ensure that sufficient units are available for service each day and the correct units are returned to depot at the specified intervals to meet the exam and servicing cycles. These two roles are also split across two sites, Basingstoke and Waterloo.

7.4 Service Management Process and relationship between Control and Resourcing

Within normal day to day operation the Train Service Manager will undertake service interventions required due to low level perturbation in accordance with the 'White Pages': a reference document created to prescribe the activities that can be taken on a train by train basis to recover late running. Following identification of the intervention, the TSM will advise the TRC of any train control changes required (skip stops, running fast line etc) who will advise the relevant signallers, in addition the TSM will advise the DRM where there is likely to be a traincrew impact (identified from Genius diagram data available in the Control) and the relevant FPM if there is to be an impact on rolling stock resources. In low level perturbation this workload is manageable utilising verbal communications over the phone between the relevant parties. It should be noted that as the FPM is responsible for rolling stock planning and the DRM/SRM for traincrew planning, the TSM has no accountability for the deployment of either resource when making train service interventions. Consequently, any intervention that the TSM takes or suggests is subject to the ability of those two roles to balance their own resources – this is critical in the case of traincrew but less so for rolling stock.

For more significant disruption the TSM will refer to the Contingency Plans which set out how the train service should be thinned out and on which routes/services when the

planned level of capacity is not available on the network. In such a circumstance the SDC role will step-in and provide the strategic direction on the implementation of the Contingency Plans, usually following an immediate 'time-out' conference call held between the RCM and 2xSDCs plus ICEM to discuss immediate responses to the disruption and key messages for public communication, whilst the TSM will implement the tactical response of turning trains, terminating, diverting, cancelling and arranging amendments to traincrew allocation through the DRMs. It is noted that whilst these documents are in the process of being reviewed, neither has been subject to review since at least 2013 and consequently intervention advice based upon traincrew and rolling stock allocation may not be accurate, given amendments to base diagrams occurring in recent years or indeed the operation of longer trains.

A questionable outcome of the move to Basingstoke has been the splitting of the TSM and Waterloo Resource Management functions (Crew and Rolling Stock) previously co-located at WICC. Within any Control the effective flow of information through the service management chain, from incident management, through train service re-planning, to implementation is absolutely crucial to successful outcomes. Whilst NR has been able to maintain, and potentially improve, the integration of Infrastructure and Train Service management (through closer working of the IC and TRC overseen by the SDC), this appears to have come at the cost of effective train service re-planning and implementation, with ALL train service interventions now having to be undertaken verbally over the phone between the TSM and the resource centres. This is exacerbated by what appears to be relatively rudimentary information management systems supporting the process, which are not integrated in any meaningful way; this being perfectly exemplified by the fact that all train service alterations undertaken by the TSM are verbally advised to the Information Controller, generally by the TSM walking over to the Information Controller desks to provide the advice – a method of communication that cannot possibly be sustainable during severe disruption.

As previously noted, all train service interventions are 'subject to train crew' i.e. the ability to implement them is solely a function of the train crew's ability to be moved across diagrams, routes or rolling stock or the remaining time in the shift. This means that planned train service interventions generated in good faith by the TSMs may not be implementable, but in disruption the volume of interventions will mean that there is little or no possibility of re-visiting any undeliverable interventions. In addition, the time taken

to communicate the revised plan to the resource centres who then contact train crews (noting that drivers do not currently have company-provided mobile phones/smart devices – drivers are contacted via guards or signallers) to implement the intervention delays the service recovery process leading to longer and more protracted recovery from incidents.

A further factor which affects the train service management process, and which is addressed in Section 10, is that train crew route and traction knowledge is variable and complex, and that there are deficiencies between the intended and actual competencies held by a reasonable numbers of drivers (in particular). This means that competence to undertake a different role/activity in disruption has to be checked rather than relied upon. We consider that the underlying complexity of the train crew resource plan, and the difficulties that arise managing it during disruption, are major factors in the increase in reactionary delay since December 2014.

The upshot of the current structure is that the TSMs are the fulcrum for the majority of train service management activity within the service management process, facing inwards to the SDC/TRC/ICs within the ROC and outwards to the DRMs and train crew and undertaking almost all communication verbally. The workload of the TSMs, who are split geographically, is high even on a normal day and in disruption is almost overwhelming; within the current structure of the ROC we do not consider there to be sufficient 'bandwidth' (decision and communication capacity) within the TSM organisation to be able to manage disruption successfully. We note that SWR has a number of committed obligations designed specifically to address the issues around communication and co-ordination of train service interventions, however, we are concerned that without addressing some of the fundamental underpinnings of this process and structure the required improvements may not be fully realised.

7.5 Assessment of the SWR Control arrangements

Our assessment of the efficacy and capability of the current control structure, based upon discussion with a great many number of people, is that it has a number of significant draw-backs which limit its ability to function effectively. These are:

- The lack of a senior on shift SWR presence within the control to further SWR's interests in train service and incident management (this is exacerbated by the lack of senior TOC staff based at Basingstoke)[19].
- The isolation of the TSMs from the other key elements of TOC resource management; this includes fleet and crew resource management being at different locations.
- A lack of capacity and capability (bandwidth) within the TSM group to deal with the increased workload that occurs during disruption.
- The lack of integrated IM systems to support the control in making decisions and communicating interventions.
- Insufficient processes for controller training, competence management and incident review supporting controller learning and development.
- The current floor plan favours NR controller communication at the cost of SWR TSM – IC communications

On the basis of the above limitations, it is our view that the opportunity should be taken to fundamentally review the organisational structure and fitness for purpose of the current Control and resource management arrangements.

Taking the above limitations into account, and considering these in light of the operational complexities inherent within the SWR operation, we consider that the structure and the capability of the SWT/SWR Control is a major contributory factor in the increase of reactionary delay that has occurred since 2014.

[19] SWR has introduced a Head of Control projects post and more recently reintroduced a more senior resource to lead the SWR control team

Committed Obligations addressing control capability and service management

CO48 – introduction of a package of measures to assist controllers in incident and service management including;

- Implement a decision support system by May 2019
- Review and update of all Contingency Plans plus creation of station disruption plans
- Implement a train fault diagnosis assistance system to improve fleet failure response
- Incident management flow-charts for the top 20 incident causes
- Provide drivers with tablet smart devices to improve communication of service changes
- Introduce a specific competence management process for incident management

CO50.2 – funding of interventions at Chertsey to allow Class 158/9 units to utilise this route to/from Waterloo in the event of disruption on the mainline

CO52 - implementation of an incident handling training and simulation package for controllers with annual refresh.

7.6 Potential revised Control organisation and structure

In our view the SWR element of the Control needs to be enhanced to provide greater focus on service delivery and to increase its capacity and capability to manage the train service.

To do this will require SWR to step away from some of the core principles of the Integrated Control that have been in place since 2007. We believe this to be unavoidable. For SWT the move to Basingstoke was probably a forced error, however NR is unlikely to consider a return to the WICC as viable, given that the Wessex Route HQ is in the same building. It is acknowledged that such a withdrawal by SWR would go against 'alliancing' principles.

An alternative structure for the SWR element of the Control could be one that:

- Contains an SWR Duty Manager or Senior Train Service Manager (STSM) responsible for managing TOC Safety of the Line incidents and providing Senior TOC input into the control.
- Co-locates Train Service Management with resource management teams to remove the schism that currently exists within the implementation of train service interventions and arranges the three TSM areas (Inner, Outer, and Windsor) into mini-control pods.

- Enhances 'Customer Service' Control to take pressure off the TSMs having to deal with customer service and stations issues, and provides a better link into Customer Information & Communication processes
- Exploits developments being pursued at Waterloo to split station control and revise driver depots required for the SLC2[20] timetable uplift commitment.

[redacted]

[20] Service Level Commitment 2, a requirement of the existing franchise agreement

[21] [redacted]

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[redacted]

8. Infrastructure management and performance

8.1 Context

It is axiomatic that a high performing train service requires highly reliable infrastructure to operate over. Over the review period the number of delay incidents attributable to non-track assets reduced by about 12%, implying improved asset quality, which is confirmed by NR's own comparative composite reliability indicator data across the Routes. Considering the steadily ageing average age of signalling assets this is perhaps worthy of congratulation. However, simply counting the number of incidents might be useful if you are an asset steward, but how those incidents are managed and how much impact they have on the train service are of great importance to the end customer. Sadly, the data shows a huge growth in DPI across the eight year review period, almost a threefold worsenment.

For Track it's slightly worse even than that. Here we have the incident count remaining broadly static across the eight year period, with DPI showing a very similar adverse trend of nearly threefold deterioration. The number of track defects can be seen as an indicator of the underlying health of the track asset, and the way it is being maintained and renewed. The number of Track incidents occurring represents a major area of concern for performance, as these are often high impact events.

8.2 Infrastructure maintenance and renewals

It is clear that the Wessex infrastructure maintenance team is under pressure. There are a number of things which have come together over a period of time to conspire to make its life harder:

8.2.1 Rate of asset renewal

The rate of asset renewals has been insufficient over several Control Periods to maintain average asset life in a steady state condition. For example, the average used life of ballast has increased from around 50% in March 2010 to 56% at March 2018, and is projected (based on the agreed renewals profile for CP6) to reach 62% by March 2024. Likewise, the average used life of sleepers has gone from 61% in March 2010 to 66% in March 2018, and is projected to reach 73% by March 2024. Given that ballast and sleepers are the foundation on which the rest of the railway infrastructure sits, gradually decaying ballast and sleepers implies increasing problems with contaminated ballast, wet beds, flooding, dipped joints, poor quality top and line, leading to track circuit failures, rough ride reports,

broken rails and TSRs for Condition of Track. None of this sits well with the desire to operate a high performing railway.

8.2.2 Tightening of safety procedures

The tightening of safety procedures, whilst obviously important to reduce occupational health and safety risk exposure, has contributed to much greater difficulty in getting quick and easy access to the track to carry out work. There have been several such changes in recent years:

- Restrictions on manual handling, meaning that more specialised plant such as KGTs[22] is required to manoeuvre lengths of rail on site
- The requirement to carry out additional strapping for third rail isolations has increased both the time and cost of achieving electrical isolations before starting and after finishing work; with fixed length possessions this has resulted in less time available overnight and at weekends for productive work
- The revised Business Process on "Safety of people on or near the line", which took effect in March 2017, introduced a much firmer hierarchy of staff protection arrangements. This has acted to move much work from day-time red zone working to night-time green zone working, and also imposed considerable additional pre-planning burdens on maintenance delivery support staff. Apart from increased costs arising from this change due to moving to less productive possession windows, the time periods taken to plan the work into possessions imposes extra strains when trying to get lots of critical maintenance activities planned to be carried out in a reasonable timescale.
- Prohibition of using mobile phones or two way radios when driving a road vehicle, meaning that it is impossible to use time in road traffic effectively to plan incident response, or to be re-directed in the event of changing needs. This acts to slow down incident response and fix times.
- Getting access for maintenance or operational response staff to deal with faults and other incidents occurring during traffic hours has become much harder. Often this means trains have to be stopped on more lines than used to be the case in order to allow staff access to assess or repair a fault, or faults are left until the next

[22] On-track machines to lift and shift equipment and components

night before an attempt at rectification is made. In either case, an increase in the amount of delay incurred by any given incident will occur.

8.2.3 Track Access

Competition for scarce track access increased as enhancement projects came on line. This affected the Windsor Lines with the 10-car project but more particularly caused significant pressure on the critical track sections between Clapham Junction and Waterloo.

8.2.4 Operating cost pressure

Regulatory pressure to reduce operating expenses has resulted in assumptions being made regarding improving efficiency. This has resulted in less funds for maintenance in real terms over the last two Control Periods at least (the figures in the table below are at cash prices).

Total Route Maintenance Budget and Spend

	Budget	**Actual**		**Budget**	**Actual**
CP4	*£000s*	*£000s*	**CP5**	*£000s*	*£000s*
2009/10	61,716	59,181	**2014/15**	69,554	73,838
2010/11	58,086	57,989	**2015/16**	70,095	70,345
2011/12	57,216	58,135	**2016/17**	69,192	69,374
2012/13	58,126	58,789	**2017/18**	71,884	75,336
2013/14	65,432	65,937	**2018/19**	81,547	-

Whilst cash spending increased somewhat during CP5, it was still indexed so as to produce a year on year reduction in real terms funding available. Unfortunately NR has not been able to achieve the efficiency improvements predicated for maintenance in the last two regulatory settlements.

Cost pressure during CP5 forced a reduction from three Delivery Units to two. The result of this has been much more stretch for the senior expert engineers involved in each discipline. It is noticeable that an overspend against the budget was permitted in 2014/15 and again in 2017/18 after realisation that maintenance was under strain.

So we can see that various changes over time have led to unit costs increasing and productivity declining. Given that the budget overall is generally regarded as fixed within the Control Period[23], there is no opportunity (as on an enhancement project for example) to uplift the total cost and expect the client to pay for it. So, the end result is that less proactive work gets performed which then exacerbates the problem as more reactive, unplanned work becomes required to tackle the problems which spring up.

Pressure to reduce costs has also seen reductions over time in the numbers of incident response staff, especially Mobile Operations Managers. This means that it can take longer for appropriate staff to reach the site of an incident.

8.2.5 Renewals plans

The CP5 settlement for renewals was based on a strategy of "maintain assets in broadly the same condition" and has been described in hindsight as a tight settlement. Looking forward, the Route's renewals submission for CP6 was for a significant improvement over CP5 levels, but was then constrained to a level some way below the unconstrained level. Whilst it represents around a 15% increase on the CP5 level, it is heavily skewed by the need to provide adequate funding for the Feltham resignalling project. This has resulted in a tough decision being made to remove the funding for the medium output ballast cleaning programme that was planned. I understand that this decision is likely to lead to the relevant MOBC system being mothballed in CP6. The Route has recognised that this decision means that average asset condition of ballast will deteriorate through CP6 and that this is unsustainable in the longer term.

ORR has suggested in its draft determination that £1bn from the proposed overall CP6 settlement should be diverted and made available for renewals over and above the renewals submissions made by the NR Routes collectively. There is thus an opportunity

[23] Whilst NR has the capability to move funding between headings, in practice such changes are only agreed by the centre as a matter of last resort, and so Route management teams usually have to manage within their agreed budgets.

for the Route to bid for, and for NR centrally to recognise, the need to tackle the emerging backlog of core renewals on Wessex Route.

8.3 Findings

It's apparent that the Wessex maintenance delivery organisation is struggling to juggle the multiple demands placed upon it: increased levels of safety-planning, extended planning timelines to get work done, large numbers of reactive faults needing to be attended to, with access to the track ever more constrained, cost pressures, and management stretched over bigger geographic areas. Whilst it is still just about afloat, it is tempting to ask whether it is 'waving or drowning'.

From what we have seen it is clear that it is not a viable longer term strategy to continue to under-renew key infrastructure assets and starve the maintenance team of sufficient funding to be able to do an effective job, whilst at the same time running more and longer trains over the core parts of the network and then expecting performance improvement to occur.

However, there are some opportunities for improvement available:

- A move towards cyclical routine planned maintenance, with standardised possessions and isolations, should simplify maintenance and possession planning, and enable work to be moved onto a more predictable and organised footing.
- The benefits of the Safer Isolations programme, currently being implemented across the Wessex area, should reduce wasted on-track labour resource and improve the productive time available within overnight possessions.

These possibilities are considered in Section 9 below.

9. Improving overnight infrastructure maintenance productivity

We have seen in Section 8 that maintenance capability is stretched on the Wessex Route. We also know that there is a pressing need to improve infrastructure reliability in order to drive performance up. Nowhere are these two twin considerations more apparent than on the most intensively used stretches of the Wessex Route network: the critical sections

between New Malden and Waterloo on the Main Lines, and Barnes to Waterloo on the Windsor Lines.

On these sections of track, getting access to the track is more difficult than most other parts of the Route, due to the intensive nature of the service operated, the tight curves increasing wear and tear and restricting sighting, the lack of refuges for track workers, the elevation of the tracks on viaducts for the most part, and the lack of any diversionary routes.

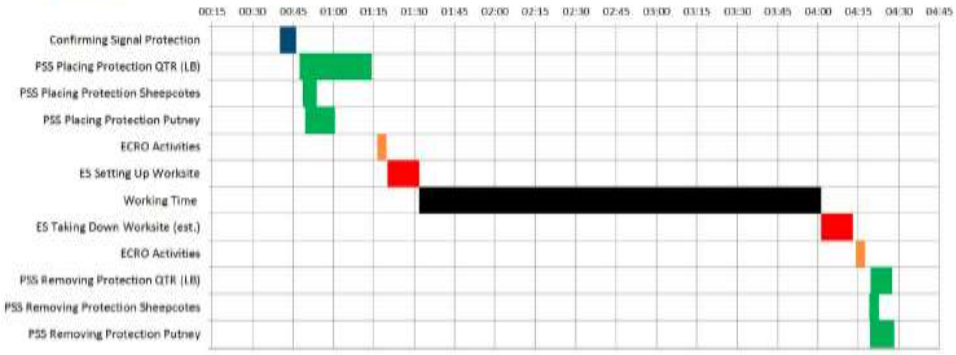
The nature of the train service operated, along with ancillary Empty Coaching Stock movements to and from depots for first and last services, means that the overnight time available for maintenance work is severely restricted, typically to less than four hours in total. On these sections of track it typically takes a minimum of 45 minutes to create a possession and isolation before work starts, and the same amount of time after work ends to remove it.

The following illustration of a typical possession in this area is shown to provide a graphic example of the impact this has on effective working time overnight:

C-C06 / C-CW06 Queenstown Road - Putney
Timing Details

Possessions Analysed = 8

	Activity	Average Start Time	Average End Time	Average Duration	Min	Max
00:06	Confirming Signal Protection	00:40	00:46	00:06	00:02	00:08
00:26	PSS Placing Protection QTR (LB)	00:47	01:14	00:26	00:13	00:49
	PSS Placing Protection Sheepcotes	00:48	00:53	00:05	00:02	00:08
	PSS Placing Protection Putney	00:49	01:00	00:11	00:07	00:15
00:03	ECRO Activities	01:16	01:19	00:03	00:01	00:05
00:11	ES Setting Up Worksite	01:20	01:31	00:11	00:07	00:15
02:29	Working Time	01:31	04:01	02:29	02:20	02:40
00:11	ES Taking Down Worksite (est.)	04:01	04:13	00:11	00:07	00:15
00:03	ECRO Activities	04:14	04:17	00:03	00:02	00:10
00:09	PSS Removing Protection QTR (LB)	04:19	04:27	00:08	00:03	00:11
	PSS Removing Protection Sheepcotes	04:19	04:22	00:03	00:02	00:08
	PSS Removing Protection Putney	04:19	04:28	00:09	00:07	00:13
00:03	Signal Protection Removed	04:28	04:31	00:03	00:02	00:02



A possession nominally 3 hours and 50 minutes in length (0040-0430) has a maximum of 2 hours and 30 minutes work time within it. Allowing within this time for ferrying materials and workers to site, this is barely sufficient time for, say, a single weld to be undertaken to a high standard.

The result of this is a low level of productivity, and therefore a consequent low efficiency of maintenance spend. It also means that the amount of access time available is simply insufficient to maintain all the assets to the required 'gold standard' for these critical sections of track.

The proposals contained within the current franchise agreement would further worsen the access time on these key sections of track as well as across the whole of the rest of the network. Yet the number of passengers involved in travelling on the existing first and last services is low on most days of the week, very low compared to the numbers travelling by day who depend on reliable infrastructure for their journeys. For this reason

we consider that proposals to start services earlier in the morning and finish later at night are ill-judged and should not be progressed.

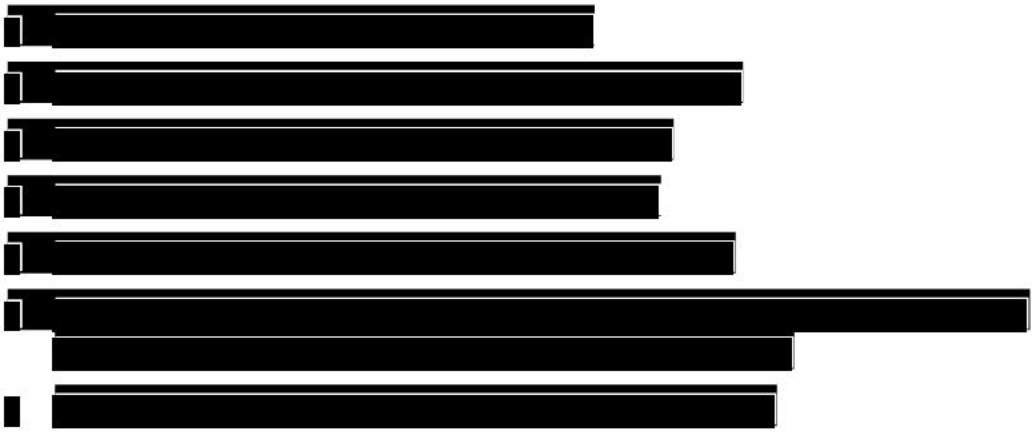
With some small compromises to existing first and last trains, and a possible split approach to different days of the week, it should be possible to create routine access to the track in the London area on a much-improved basis to that provided today, and enable a cyclical approach to maintenance to be introduced, plus an "'every-night' capability to carry out emergency repairs to components detected during the day as requiring urgent attention.

9.1 Proposals for amended access

We are laying out proposals here for three different track sections:

9.1.1 Waterloo to New Malden Main Lines and Waterloo Windsor Lines to Clapham Junction (exclusive)

On these track sections there are no planned revenue-earning freight services. The object would be to create a 'no trains period' of 4 hours 30 minutes each weeknight, Sunday to Thursday nights, between 0030 and 0500. This can be achieved by;



On Friday and Saturday nights no planned maintenance work would be scheduled as a norm, except that requiring a longer Saturday night into Sunday daytime possession, which would be handled through the normal possession planning process. This would enable later night services to be provided to and from Waterloo on these busier leisure nights, an attractive *quid pro quo* to trade for the small loss in late night services on other weeknights.

Such a change, combined with roll out of the safer isolations programme to these sections of track, as currently planned for CP6, would enable a five nights a week 'all points' standard possession and isolation to be taken, and very much quicker than it is today. Isolations need to be planned to allow for berthed rolling stock to remain energised wherever possible, to reduce 'pump up' time in the mornings when preparing trains for early service.

This would enable significant improvement in 'on the tools' productivity for permanent way, electrified track maintenance and signalling maintenance staff. Effective work time would go from 2 hours 30 minutes (at best) now on an occasional basis, to 3 hrs 30 minutes on a five nights a week basis.

9.1.2 Clapham Junction (inclusive) to Staines (exclusive) via Richmond and Hounslow

This section is used by freight trains routed from the West London and South London Lines via Clapham Junction, and from the North London Line via Kew East Junction (on the Hounslow loop). The configuration of lines means that it should be possible to plan weeknight standard possessions (on a similar basis to those described above) but on an alternating A and B pattern:

A: Fast lines Clapham Junction to Barnes and Main Line Barnes to Staines via Richmond

B: Slow lines Clapham Junction to Barnes and Hounslow Loop to Staines via Brentford

Over these sections of line it should also be possible to achieve a 4 hour and 30 minute standard possession time with minor service adjustments

9.1.3 Raynes Park to Chessington and to Guildford via Epsom, New Malden to Strawberry Hill, New Malden to Hampton Court, Effingham Junction and Byfleet Junction, and Woking Junction to Guildford.

These lines also have no regular overnight planned revenue-earning freight services and so there is the possibility of a similar arrangement as outlined above with some minor service adjustments. Arrangements for Empty Coaching Stock to and from Wimbledon

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Park depot for first and last services need to be carefully planned. There might be a need to out-berth one service, possibly at Dorking. (On the route section between Byfleet Junction and Woking Junction there are overnight freight services but the four track layout makes maintenance access less challenging.)

[redacted]

Summary

A package of changes along these lines would transform the access for maintenance, dramatically improve productivity and efficiency, and enable significant improvement in infrastructure reliability over time. Passenger dis-benefits would be very small overall, but would need careful political handling as first and last trains are notoriously sensitive matters with passengers.

Committed Obligations addressing maintenance access

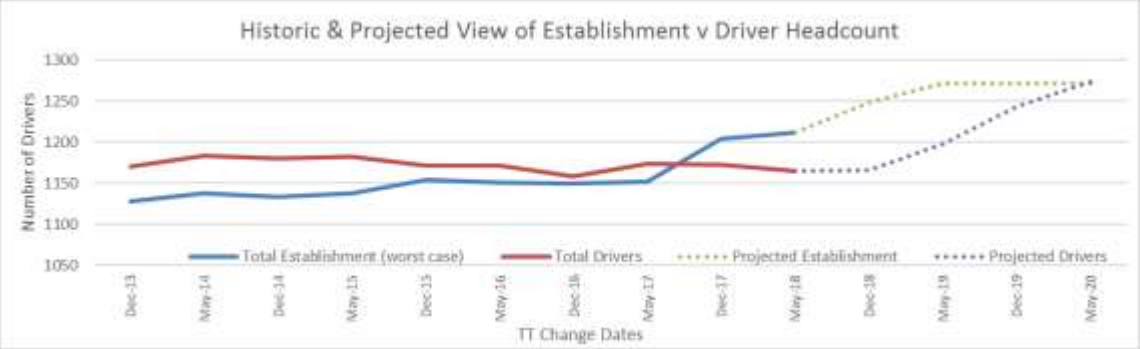
CO50.4 - SWR to work with NR to develop and agree an updated electrical isolation strategy to deliver improved isolation practice to support network maintenance and enhancement

10. Operations and fleet

This section considers some of the key factors in delivering the train service.

10.1 Traincrew – Driver establishment & headcount

The establishment of drivers required to deliver the May 2018 timetable is 1212 and a current driver headcount of 1165, so there is a deficit of approximately 47 drivers. Based upon data supplied to us, this is the first time since at least the December 2013 timetable that the number of drivers has been less than the required establishment. This has occurred due to a very gradual reduction in the number of drivers employed over the years and a recent increase in the establishment in December 2017 due to the increase in spare turn cover from 42.5% to 47%. The following graph shows the historic and projected relationship between headcount and establishment[24].



Within the establishment numbers we have identified that SWT used (and SWR continues to use) Cover Turn diagrams. These are diagrams inserted into the roster which are there entirely to provide contingency for non-availability of drivers on a given day and as they are contained within the diagrams they contribute to the Spare Cover calculation. As these roster turns are not required to deliver the core service this is essentially an insurance policy and recent timetables have contained up to 34 cover turns per SX day (~220 per week). This equates to an additional headcount over core requirements of ~80

[24] It should be noted that the establishment projection for Dec 2018 was based upon the whole timetable bid being delivered which is no longer the case. Instead the establishment will step up in stages as the enhanced timetable is delivered over subsequent timetables.

drivers and is entirely an arrangement that is within the TOC's gift to continue. This practice should be mitigating against the deterioration in performance and it is inevitable that without these turns (which are not a universal practice) PPM performance would be worse.

[redacted]

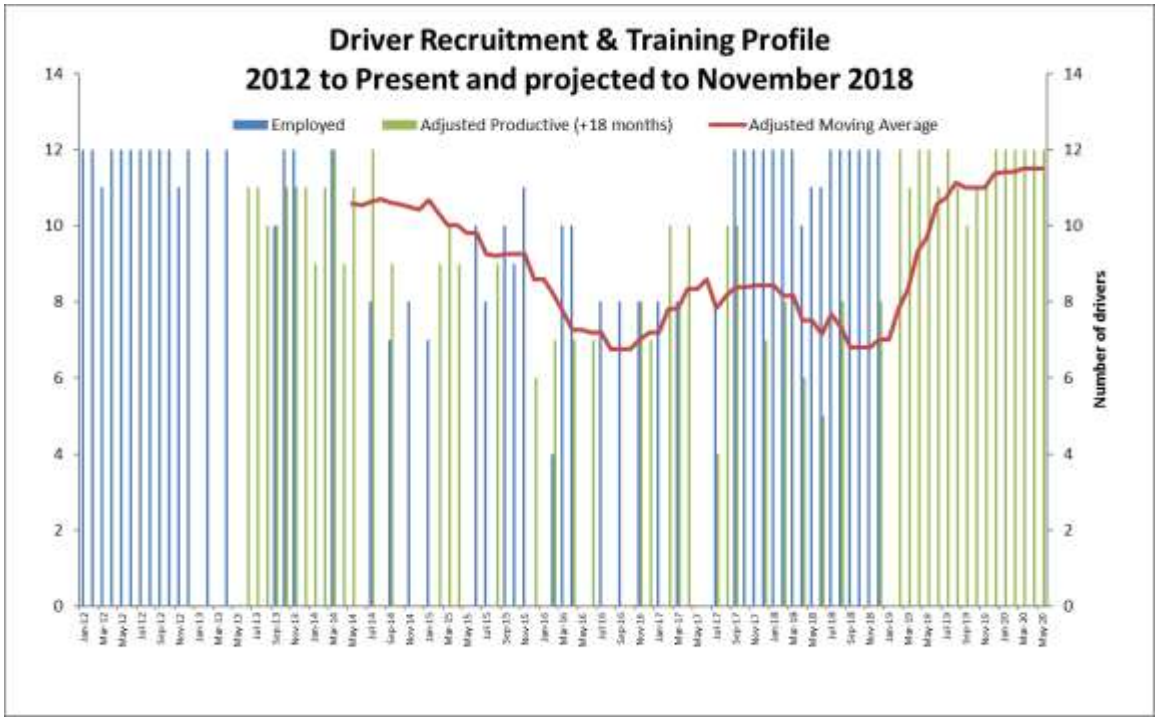
Discussions with the driver and resourcing team have identified that the historic headcount was inflated by a relatively large number of drivers being either restricted in the hours or duties they could work or unable to drive at all. The management of this has been a focus for the driver team in recent months and we are advised that the number of unproductive drivers is beginning to fall.

Driver recruitment is an ongoing activity, and SWR has identified driver training and establishment as a key issue for the franchise. Indeed, prior to taking over the franchise FirstGroup contracted SWT to undertake recruitment of a number of drivers so as to be able to fill a training course within the first weeks of the franchise handover[25]. Since that time SWR has recruited 93 drivers and delivered a new training course for up to 12 drivers every month, and projects that this will continue at least until the end of this year. To facilitate this SWR has increased the number of Driver Instructors (DI), is out-basing trainee drivers at locations with spare DI capacity in order to meet the demand and

[25] It is noted that this requirement came about as a result of the Clarification Question process within the franchise bidding period.

hasamended DI rosters to be a 5 day week (instead of the 4 day week of a normal driver) to match the training roster and to maximise instruction time for new trainees.

The following graph shows the historic trend for driver recruitment and training since January 2012. Whilst initially the number of drivers recruited and trained was the maximum possible, from May 2013 onwards the number of courses and the number of drivers recruited fell. There are some notable periods, such as April to August 2013, February to June 2015 and April to June 2017, during which no recruitment was undertaken. A reduced level of recruitment was feasible for SWT at that time as the number of drivers employed exceeded the establishment. The net effect of this reduction though has been to reduce the pipeline of new drivers entering service, albeit that it was sufficient for a steady state operation. The graph itself shows the number of drivers recruited per monthly cohort and the number in each cohort who became productive (or are expected to do so); this latter number is shifted forward in time by 18 months to represent the worst-case training period required to take a person with no railway experience through to full competence. The red line represents the number of drivers becoming productive each month (it is not adjusted to reflect the net change in the headcount overall).



As a consequence of the driver recruitment decisions made in the last 12 months of the SWT franchise the number of new drivers becoming productive per month over the next six months will actually fall. It is noted that these decisions were made:

(a) within a four-weekly manpower planning meeting structure which continually reviewed establishment trends and business needs to ensure sufficient drivers were available, and

(b) within the confines of the planning horizon afforded to the incumbent franchise which would not have definitively known of the planned December 2018 timetable uplift.

As it typically takes a minimum of 18 months to get from the point of decision that additional drivers are required to them being productive, and that the recruitment and process does not deliver all the required drivers at the same time (being staggered by the number of places on training courses) it is highly probably that a timetable uplift occurring within 18 months of a franchise change will suffer from driver resource shortages, at least in the initial months of the timetable's operation.

In order to address the identified deficiency SWR has implemented a number of changes which result in a reduction in the number of unproductive drivers within the business and an increase in driver diagram efficiency. These include the acceleration of Class 707 training which was completed during the currency of this review, allowing training resources to be freed up for the Class 442 programme. In addition, the diagrammed Cover turns are being removed in favour of rostered spare turns – this allows spare drivers to be rostered more flexibly to cover leave or roster gaps and reduces instances of unused spare turns – this will be implemented in December 2018. [redacted]

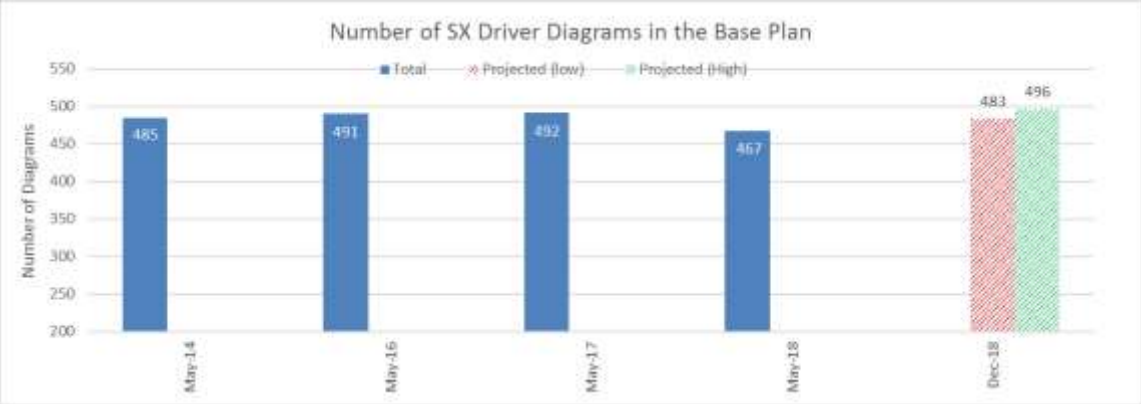
10.2 Driver diagramming and complexity

One of the recurring themes within our conversations with operational staff when discussing the issues affected South Western is the complexity of traincrew diagrams (especially for drivers). Four potential causes have been suggested for this: diagram efficiency, core route & traction knowledge, route & traction variation and full crew working.

10.2.1 Driver diagram efficiency

It has been suggested by a number of different sources that SWT had pursued a policy of seeking diagram efficiencies during its second franchise and especially during the period of time that the deep alliance was in place. During the period of the second franchise when SWT was eligible for "cap and collar" revenue support it could have been incentivised to do so.

We have not found any evidence that this was the case. In fact discussions with key members of the former SWT leadership team, and trawls through those historical documents which are still available, show that there was no specific diagram efficiency exercise undertaken at any time between May 2012 and August 2017, whether utilising either specialised software or experienced train planning and diagramming staff.



The evidence we have been able to obtain shows that the number of SX diagrams was relatively stable at between 485 and 492 between May 2014 and May 2017. The methodology for calculating the establishment was changed in May 2012 and brought more into line with what became the RDG/ATOC good practice approach; consequently, we have been unable to obtain data showing the number of SX diagrams prior to May 2014 so cannot consider the longer term position.

As far as we can tell from the historical data available, it appears that the pursuit of diagram efficiency within the driver grades has not been a contributing factor to the degradation in franchise performance.

It is worth noting that SWR have introduced TrainTracks diagram optimisation software which is being used for the first time for the December 2018 timetable.

10.2.2 Driver route & traction knowledge

In order to deliver the train service, each link[26] within each drivers' depot has a core set of routes and traction types which they are required to be competent on. Each driver's diagram generated for each link/depot is based upon this core requirement and therefore the planning assumption is that each driver's route and traction knowledge is compliant with the core requirement.

Over recent years it has been suggested that compliance with core traction and route knowledge has diminished, whether this is by accident or design has been difficult to ascertain but contributing factors we have identified include:

- The introduction on new rolling stock (Class 456, re-tractioned Class 455 and Class 707) which increased the training requirement but also the number of traction types that drivers (especially 'inner' drivers) are required to know
- The principle of 'link progression prior to competence'. At Waterloo Drivers depot drivers progress up the driving links as senior drivers leave the senior links. Progression is permitted without competence on the traction or routes pertaining to the link to which the driver is moving, and training occurs once in the roster. As the average age of drivers increases and driver turnover rises, so more drivers will be subject to progression. This means that for any driver who is promoted up a link without the requisite route or traction knowledge the work on that driver's line in the roster must be covered by another driver – typically through rest day working – or where the driver has partial route or traction knowledge the rostered work must be split with another driver on the day so that all the jobs are covered.

To give an example of the current situation with route & traction knowledge compliance, at the start of June 2018 there were:

- 80 drivers[27] from a pool of 481 who had yet to start training Class 707 traction (the total number of drivers requiring Class 707 training has been reduced from SWT's initial plans)

[26] a link is a group of drivers within a depot sharing a common roster and provided with certain driving work that meets a set of common characteristics

[27] SWR has recently accelerated Class 707 driver training and has now cleared this backlog

- 25 drivers out of 54 in Waterloo link 2 who are route knowledge deficient to either Bournemouth/Poole or Alton
- 6 drivers out of 36 in Waterloo link 1 who are not competent on Class 158/159 traction
- 35 drivers out of 48 in Waterloo link 3 who do not sign the Portsmouth route

All of these examples are subject to a plan to recover the deficiency (partially giving rise to the increase in rest days worked noted earlier), but as it stood in June 2018, to obtain full route & traction compliance at Waterloo currently required 1419 training days. Any deficiency within core route and traction knowledge is a potential failure point within the delivery of the service as its mitigation requires diagrams and rosters to be amended on a case by case basis. In disruption, it cannot be taken for granted that all drivers at a depot/in a link sign all required routes or traction and consequently any Control-led intervention must be checked prior to implementation. This significantly increases the volume of communications required for each service intervention prior to implementation, slowing down Control's ability to swiftly respond to a delay event.

10.2.3 Route & traction variation

A principle known as Route & Traction Variation was adopted in the Drivers Restructuring Initiative agreement of 2006, which stated that drivers should experience workload variation so that they do not make numerous journeys over the same line, or use the same traction, throughout a single shift. There is logic in this principle as it should guard against complacency/loss of concentration from undertaking repetitive tasks and assist drivers to maintain currency in the multiple routes and traction types.

It is stated that variation should occur within diagram; for instance a driver may work a round trip from Waterloo to Basingstoke driving a Class 450, take a Class 455 to Guildford via Cobham and return to Waterloo with a Class 444 via Woking. Underpinning this principle is a matrix setting out the routes and traction that drivers at each depot, and within each link at depots where links remain, should be competent in. The extent of route and traction knowledge that is required is considerable, and consequently the volume of variation existing in the diagrams is large.

Practically speaking there are a number of issues that arise from this practice when combined with deficiencies in the core route and traction knowledge requirements, all of

which introduce complexity to the delivery of the base plan or the management of crews in disruption.

- Mid Journey relief – relieving crews mid-journey to work another traction type/over another route back to origin increases the number of traincrews who interact with a single service, and increases the number of points of failure between the resourcing of crews to trains.
- Cross contamination of delays from one route to another – late running inbound to a relieving point or terminus with the next working being to a separate route (i.e. a Waterloo driver returning from Southampton with next working to Reading) results in delays accrued on one route contaminating another and making the extent of disruption worse.
- Requirement for driver establishment to be fully compliant with the route & traction matrix – there is little scope for drivers who don't have the full route & traction competence to be able to work certain diagrams. Diagrams have to be 'cut and pasted' within the roster with, for instance, Driver A working the first half of a diagram and Driver B working the second half and vice versa. This puts a significant onus on maintaining and training route and traction knowledge, but also means that a forward view of a driver's next workings by a controller may not be accurate. About 20 weekday diagrams per day are currently 'cut and pasted' within the roster to ensure the base service for each day is covered.
- The addition of new routes to a depot or new rolling stock requires the diagrams to be reviewed and re-built to spread the variation across the diagram – this adds complexity.

An alternative to 'Variation in Diagram' is 'Variation in Roster'. This approach, which was endorsed by SWT's Drivers Council in October 2013, provides that the variation can be built into each weekly roster (i.e. as a driver progresses through the weekly roster they work different routes/traction each day) rather than the variation being built into the daily diagram. This appears to have been agreed partly as a result of concerns that Route & Traction Variation in diagram was making service management more difficult. The 2013 agreement also sought to increase the number of diversionary routes (non-core routes) signed by certain depots to improve service recovery during disruption. The benefit of 'Variation by Roster' is that it allows for diagrams to be more self-contained to specific routes and/or traction meaning that diagrams are more predictable and the opportunity for cross-contamination of delay between routes, and potentially mid-journey relief, is minimised. Despite this agreement being made in October 2013, we have not been able to find any evidence that diagrams have been developed or reviewed to take advantage

of this opportunity, and variation continues to be in diagram. In addition it appears that the agreed additional route knowledge training for diversionary purposes was not achieved as training on new rolling stock types (Class 455 re-tractioning etc) took priority.

10.2.4 Full crew working

During the deep alliance period a commercial agreement was put in place between NR and SWT that sought to maximise the amount of full crew working as a means of being able to manage traincrews in disruption more effectively. The aim of Full Crew Working (FCW) is that a driver and guard work the same trains together throughout a day; this is a sound principle if it can be achieved economically. The agreement had a target definition of full crew working and a target of 83% of work per week should comply with full crew working principles. It is noted that SWT were able to achieve this target by attaining 100% FCW at weekends, when the timetable and diagrams are simpler, but having a much lower level of FCW on weekdays – which is when FCW is of most value.

One of the outcomes of FCW, which is similar to the issue of mid-journey relief in route & traction variation, is that relieving points along the lines of route can change and vary so as to fit the available working time of the drivers and guards. This means some trains may run their whole journey with one set of crew, but others may have relief two, three or even four times en-route – and every instance of traincrew relief is a potential failure point for the train service. In addition, a train service intervention on a train with multiple reliefs en-route becomes incredibly difficult with a large number of potential outcomes for other services and routes, if a change is made.

10.2.5 Guards

We have not focused too closely on the management and establishment of guards, in the way that we have for drivers, as it appears to us from discussions within the business that there are no real concerns that the provision of guards (headcount), the state of the diagrams (which are simpler than drivers diagrams as they have fewer activities in them), or the resource management processes for guards, have contributed to the degradation in performance seen over the last seven years or are considered to be a source of inflexibility during disruption.

10.3 Depots and Rolling Stock

SWR currently operates a mixed fleet of Electric Multiple Units (EMUs) spanning three generations of technology. Ex-BR class 455/456 units now operate as predominately 10-car formations on Inner services, Siemens Desiro Class 450 trains form the backbone of the operation operating on all but the longest distance services which are operated by Siemens Class 444 units. Alstom Class 458/5 units are concentrated on Windsor and Reading services and these have been supplemented by the recently built Siemens Class 707 Desiro-City units.

Maintenance of Electric units is split between the Siemens depot at Northam (Class 444 and 450 units) and Wimbledon Park depot (remainder of the electric fleet), and recent investment in modernising the traction package of the Class 455 fleet has been undertaken to (a) improve traction reliability and (b) decrease maintenance periodicity sufficiently that the Class 707 fleet could be introduced at Wimbledon Park Depot without the need for a major and costly upgrade.

SWR's diesel services are operated by a mixed fleet of Class 158 and 159 units which are maintained at Salisbury depot.

10.3.1 Rolling stock performance

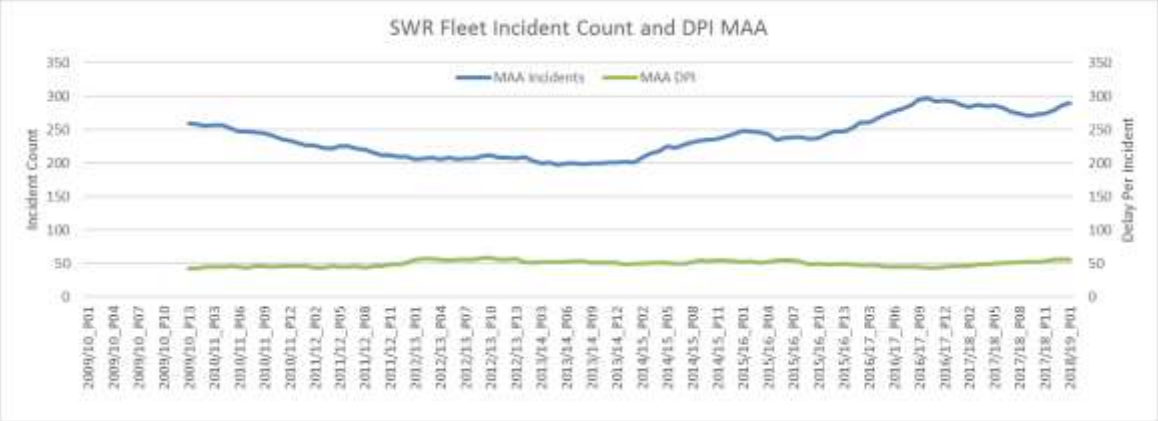
The following sections look at high level fleet performance over recent years in terms of Incident Count & DPI, Contribution to PPM failures and Miles per Technical Incident Number (MTIN).

10.3.1.1 Incident Count & DPI

Utilising attributed data[28], it can be seen that whilst the DPI for fleet incidents has remained remarkably static over the last eight years, the number of incidents occurring has been steadily rising since the start of the 2014/15 financial year, prior to which the

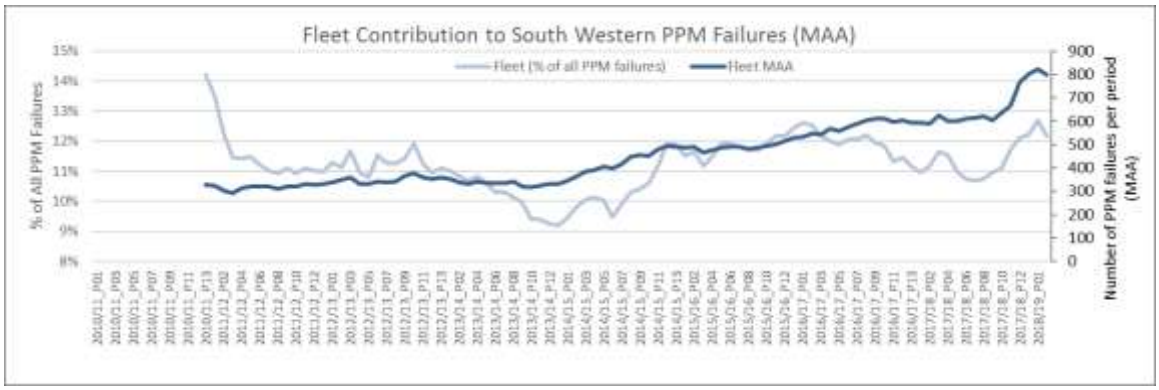
[28] This data has been provided by Network Rail from its BOPSS database

incident count had been falling. This is a slightly odd picture as it suggests that at the start of 2014/15 something significant changed within the performance and management of the fleet, or alternatively, there was a change in attribution methodology. Certainly, the increase coincides with the introduction to South Western operations of the Class 456 fleet, refurbished Class 458/5 fleet and the commencement of the Class 455 re-tractioning programme.



10.3.1.2 Contribution to PPM Failures

The increase in incidents has fed through to an increase in the number of trains failing PPM as a result of Fleet incidents, although the rise in the number of fleet failures causing a PPM failure is almost continuous from the start of 2010/11. As a relative proportion of PPM failures Fleet has been fairly inconsistent being as high as 14% at the start of 2010/11 and falling to 9% at the end of 2013/14. Recent performance in both absolute numbers and proportion of failures has become very much worse since Period 9 of 2017/18 which coincides with the commencement of the 10-car operation in the Mainline Suburban service group and the increased use of the Class 707 fleet as it was commissioned.



Whilst the percentage of PPM failures attributed to fleet causes has varied over the years (which is a function of the variable performance of other asset/causation categories) there is no doubt that the contribution of fleet failures to the PPM position has worsened with the number of PPM failures (MAA) per period doubling from 400 in May 2014 to over 800 per period by May 2018

10.3.1.3 Fleet MTIN analysis

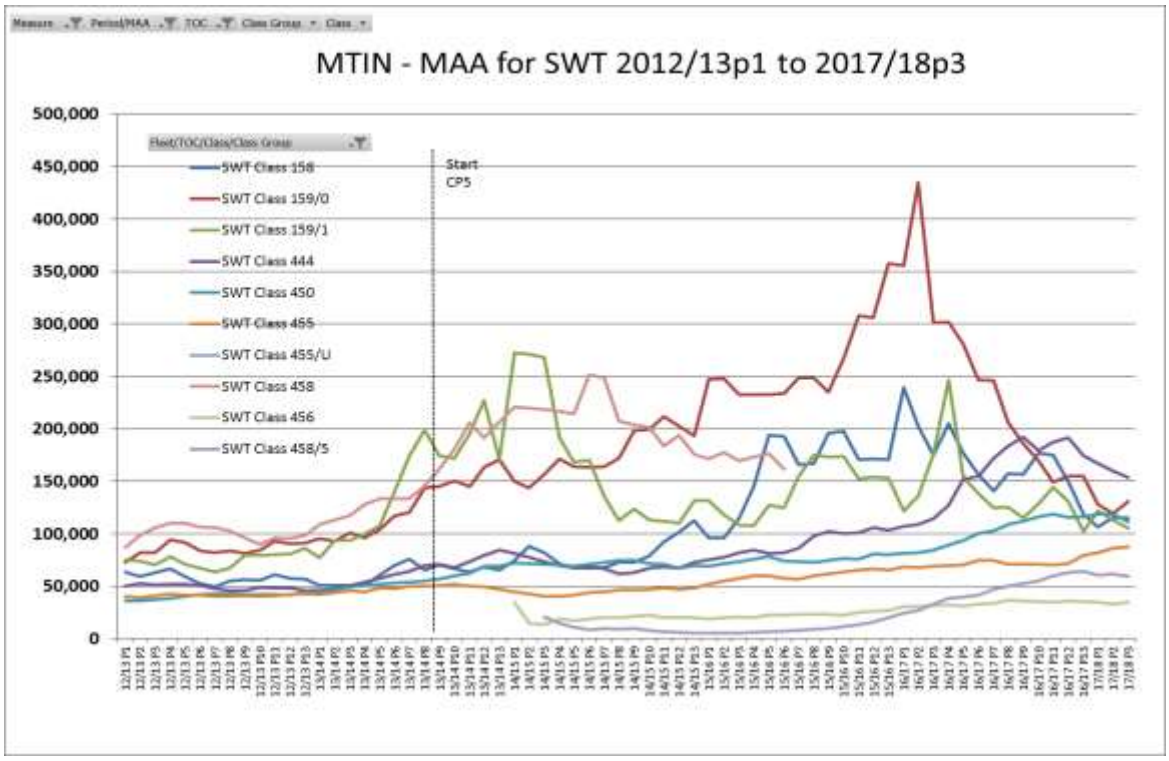
MTIN is an assessment of fleet reliability based upon the number of technical failures occurring within the operated mileage for a fleet on a periodic basis. MTIN is calculated on the basis of unit miles, and whilst SWR train service miles have been stable, the train lengthening and additional units obtained have increased the number of unit miles operated.

Assessment of relative performance over time is however quite difficult. This is for the following reasons:

- Data is manipulated outside of the TRUST-DA system within the fleet management team and is thus subject to differing approaches by management over time, depending on their goals and cultural approach
- Whilst external auditing of the MTIN process has been carried out in more recent years, there is an element of judgement involved which can lead to statistically significant differences over time
- A statistically significant change in re-attribution practice occurred at the time of the franchise change in 2017 (we explore the motive for this in section 10.3.2)

For these reasons we have found it difficult to reach any reliable conclusions on fleet reliability, despite the very significant movement in the figures which have taken place through the review period. The analysis which follows should therefore be regarded with extreme caution.

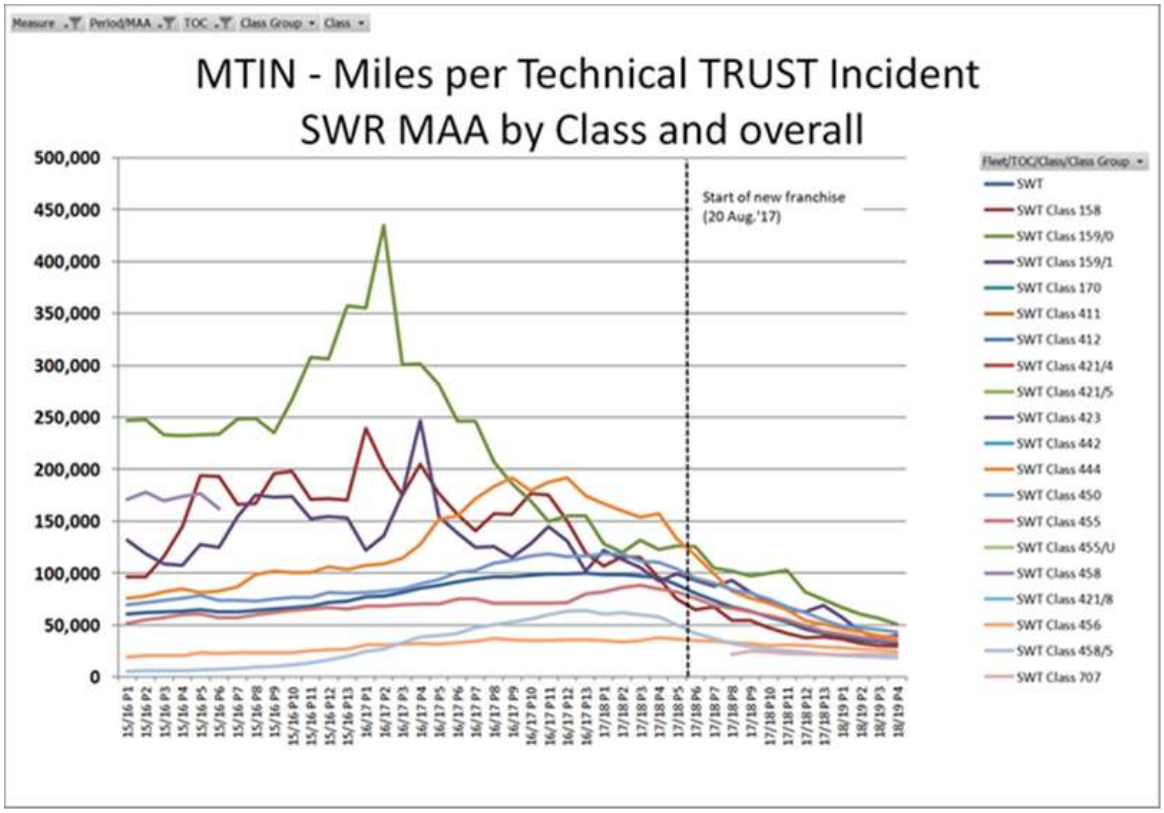
The following graph, taken from the RDG Fleet Refocus group, shows the MTIN (Miles per Technical Incident) data from 2012/13 to 2017/18 period 3 – a few periods prior to the franchise change.



This shows very significant improvement in most fleets starting in April 2013, leading to some exceptionally high values for the Class 159 diesel fleets and the Desiro Class 444 and 450 fleets with elements peaking in the Spring of 2016. Generally decline was then seen across most but not all fleets.

The most up to date version of this graph (as at Period 4 2018/19) shows the later years of the previous franchise alongside almost a complete year of operation of the new franchise. The change is striking with no fleet other than the Class 159/0 units exceeding

50,000 MTIN and all fleets returning to a level of performance comparable with, but still better than, similar fleets elsewhere on the network.



A review of the latest MTIN data published by RDG shows that;

- Class 158/159 performance continues to be at the top end of the range for comparative ex-BR DMU fleets and indeed better than the best second generation units (TPE Class 185)
- The Class 455 retractioning programme has delivered MTIN of ~27,000 in period 4 which is below the MAA figure, representing a poor period; although it is considerably higher than the Southern class 455/8 fleet which has not been converted.
- The Class 456 fleet remains the second highest performing ex-BR DC EMU and the best performing DC traction motored ex-BR EMU on the network
- Class 444/450 MTIN performance is reasonable at 44,438 and 49,221 respectively for period 4, with the MAA at 37,423 and 43,195 respectively. Even with the (nearly eradicated) attribution issues within the data these compare well against

other second generation DC units (Class 375, 376, 377, etc) which typically have MAA MTIN performance in the range of 25,000 to 35,000

- The Class 458/5 units are performing at about 18,000 to 20,000 MTIN and MTIN MAA suggesting that their performance may now be relatively stable if also relatively low. It is understood that the main challenge is door reliability which is being addressed currently.
- The Class 707 Desiro City fleet is now fully introduced to service and likely to be on the 'bathtub curve' of performance. MTIN was 13,409 in period 4 (up from an MTIN of 9,111 in period 2) with the MAA MTIN climbing to 9,315. This remains ahead of the comparable Class 700 fleet operating on GTR services.

10.3.2 Fleet performance management data

It is clear that most of the SWT fleets were achieving levels of MTIN performance that set them apart from the national picture by some distance. This was at least partly a consequence of SWT's approach to managing the data. SWT practice was to re-attribute delay incidents to other departments if there was evidence that down-stream processes failed to mitigate the impact of the incident (e.g. insufficient fault rectification by operations staff resulting in an above threshold incident is attributed to the 'failure' by staff and not the fault on the train). A consequence of this approach was that the number of incidents attributed to fleet was reduced, causing MTIN to rise and giving an upbeat picture of fleet performance. Notwithstanding this, it is generally considered that SWT fleet maintenance was managed to a high standard relative to its peer groups. It should also be noted that the duty cycle of certain SWR fleets due to the longer distances operated tends to put less significant strain on potentially unreliable components such as doors than some comparable fleets may experience.

Since the franchise change SWR has adopted a different approach, one that is more in line with most other TOCs. This has seen confirmed technical incidents not being re-attributed to other departments in the circumstances described above. This makes a material difference to the figures and thus means that like for like comparisons cannot easily be made. SWR's true fleet performance in MTIN terms will only emerge once more than a full year's data has been recorded on this basis.

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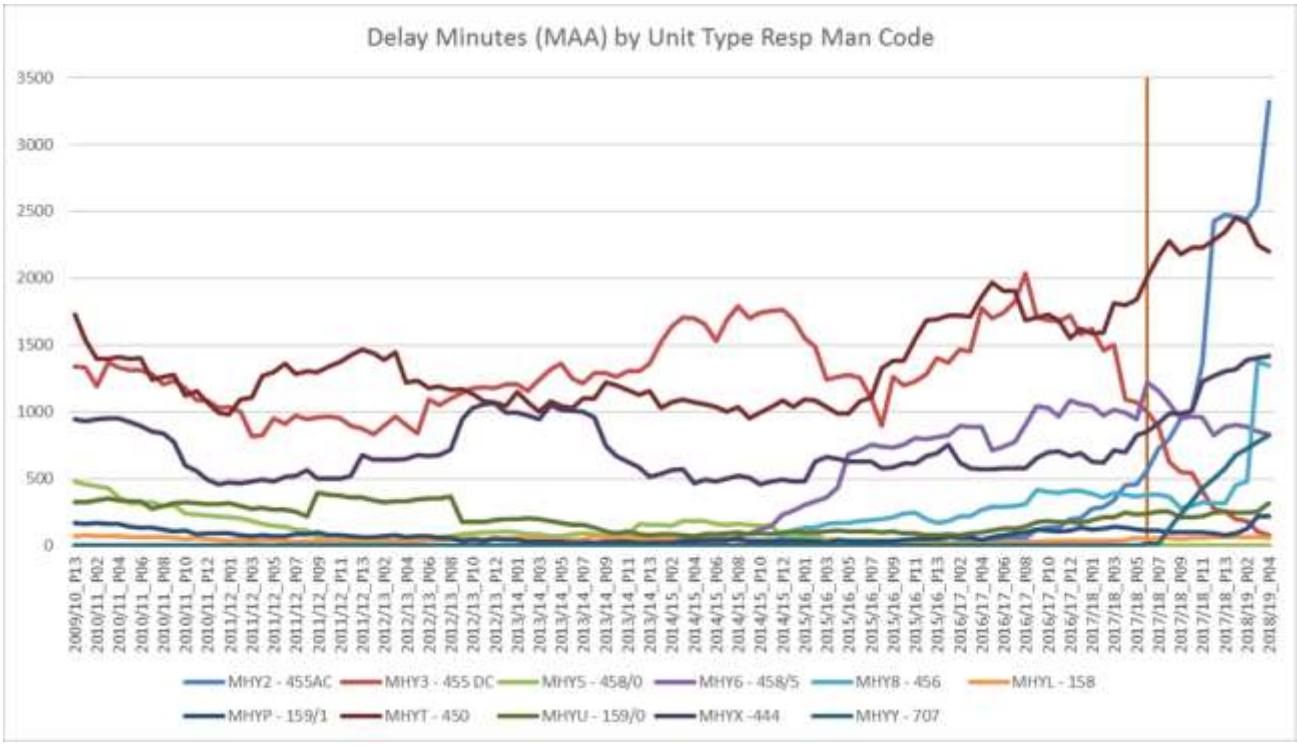
In an endeavour to obtain some longer term trend data on a consistent basis we have obtained Delay Minute data by unit type over the eight year review period and for the current year to date.



This shows the following for each type of fleet:

Class 158 – a very small sub-fleet with a consistently low level of delay impact.

Class 159 – this fleet has historically performed well and there are no obvious adverse trends established in recent years.

Class 444 and 450 – these fleets are now approaching mid-life and have started to see an adverse trend of delay impact in the last year and a half and are now causing more delay than at any point in the last eight years.

Class 455 – this fleet has been progressively re-tractioned from DC to AC traction motors over the last two years. The DC traction element impact has declined appropriately in line with its fleet size. The re-tractioned units are currently performing considerably worse than they were beforehand, but this can largely be attributed to a handful of large impact

incidents which have occurred over the last year. It seems likely that this is due to the 'bathtub curve' effect, although too soon to make any judgement on this.

Class 456 – this fleet was transferred from Southern, starting three years ago, and its deployment has changed over time and has progressively been utilised on Main Suburban services in 10-car multiple formations with 455 units. Recently there has been a large spike in delay minute impact, although this is considered to be the consequence of a single large impact event. It is too early to assess whether the fleet has yet settled down or whether more work is required to attain an acceptable level of reliability.

Class 458 – this fleet has been re-formed from 4-car into 5-car units during the period under review, and also been refurbished for its new role on the Windsor Lines. However, it is now performing substantially worse in delay minute terms than it did prior to the reforming and refurbishment.

Class 707 – this fleet is brand new, having only been introduced into squadron service during the last 12 months. It is clearly still in its 'bathtub curve' phase and thus too early to draw any conclusions.

10.3.3 Fleet management and depot operations

SWR is implementing a number of changes in order to improve the management of its fleet and the efficiency and effectiveness of depot operations. The initiatives listed below are over and above those committed to in the Franchise Agreement (except where noted):

- A **more rigorous approach to data management.** Bugle (an industry standard performance management system) is now mandated for use within the fleet team in order to be able to fully track and investigate fleet performance incidents and allocate cause to the correct responsible manager
- **Change to the lease arrangements for the fleets** from a 'soggy lease' (in which the TOC is responsible for day to day maintenance but asset management and overhaul remains with the lessor) to a dry lease arrangement whereby SWR are responsible for all elements of the train's maintenance, overhaul and asset condition
- Investment in a **new Depot & Fleet Management System** (Soros) which will unify all elements of management data associated with the trains and depot operations. This will allow the fleet team to track key outputs that affect the whole service

proposition (such as technical defects that affect passengers and performance – speed defects, toilets locked out use, door faults) and not just fleet technical issues

- **Investment in staff and leadership** within the fleet team with
    - the introduction of a ***Head of Continuous Improvement*** – see Committed Obligations 28 and 36 – to improve depot operating processes both for the current fleet and in preparation for the new Class 701s a ***Head of Train Presentation*** role responsible for overseeing all activities associated train cleanliness and customer touch points
    - a ***Senior Fleet Control Manager*** role which breaks the span of command from the Head of Fleet Performance to approximately 30 direct reports and is responsible for day to day control of the fleet by the staff based at Basingstoke and Waterloo and the fleet maintenance controller
    - A ***Fleet Operations Interface Manager*** to work directly with frontline operations teams (drivers, stations, guards etc) to improve the quality and capability of fault finding to reduce the impact of in service failurestwo new ***Fleet Performance Analyst posts*** to maximise data quality but also to deliver accurate and effective analysis of performance data to support asset management and improvement initiatives.

Committed Obligations in respect of depot operations & fleet maintenance

CO28 commits SWR to introduce from 28th February 2019 the post of Head of Continuous Improvement specifically to drive improvements in depot and fleet processes.

CO36 requires SWR to introduce a number of initiative within depots to improve maintenance practice and efficiency, such as;

- Implementation of an integrated fleet management system by March 2019
- Hand-held devices for depot staff showing real-time fleet and unit status
- Implementation of visualisation centres at relevant depots alongside the adoption of relevant Lean Management techniques on process improvement and problem solving
- Employ 5no Service Delivery Manager at Northam depot to monitor and improve Class 444 and Class 450 maintenance and servicing

CO51.3 required SWR to undertake a depot operations simulation exercise prior to the May 2018 timetable to identify possible changes at Fratton and Wimbledon depots to improve right time starts of ECS services and repeat this exercise prior to Class 710 introduction.

10.3.4 Planned fleet and rolling stock changes

With the new franchise, SWR is simplifying the suburban EMU fleet over the next two years with the introduction of 5 and 10 car Class 701 trains supplied by Bombardier. These are a variant of the Class 710 (TfL) and Class 720 (Greater Anglia) trains that are being delivered currently and as such should be a mature product by the time they enter service with SWR. As these trains will replace all the suburban fleets currently used and maintained at Wimbledon Park depot (Class 455, 456, 458, 707) it is expected that fleet performance will significantly improve (after any initial fleet introduction issues) as the benefits of a homogenous fleet of trains are realised. These should also provide operational benefits through a reduction in the number of traction types that drivers are required to be familiar with as well as reducing the number of trains operating for which there is no gangway for the driver to be able to change ends; this is identified as a cause of additional delay during disruption involving Class 456 or Class 707 units which are not provided with through gangways and consequently a line blockage is required for a driver to change ends if not at a platform. There will also be significant maintenance benefits arising from the reduction in the number of fleets being maintained. The benefits associated with the homogenous suburban fleet will only begin to accrue after December 2020 when the legacy suburban fleets are withdrawn from service, and even then only if the underlying level of performance on the Class 701 units is equal to the trains being replaced.

Committed Obligations in respect of the Class 701 fleet

CO31.1 commits SWR to introduce the Class 701 fleet by December 2020

CO31.1 commits SWR to specify the Class 701 fleet to improve dwell times through the adoption of 2 widened doors per coach of minimum 1.45m width, widened vestibules for ease of access/egress, widened corridor connections to promote internal movement of passengers through vehicles

CO31.4 commits SWR to achieving an MTIN of 45,000 for the whole Class 701 fleet within 22 months of the whole fleet being accepted into service.

SWR is also (re)introducing Class 442 units to the South Western following an absence of over 10 years. These units will ultimately be re-tractioned and will be used primarily on the Waterloo to Portsmouth route on the half-hourly fast services. These will release Class 444s from this route which will release Class 450s for additional and lengthened services

planned under the SLC2 timetable. There are risks around the reintroduction of these trains onto the operation, as they are being returned to use after a period in outside storage and during their previous use on the Brighton Main Line were averaging around 22,000 MTIN; albeit that the re-tractioning and refurbishment programme is designed to improve their reliability to a more satisfactory level. In addition Bournemouth depot is undergoing some upgrades to allow it to fulfil its role as the maintenance base for these units.

There are currently no major changes planned to the Class 158/159 fleet in use on West of England services other than an interior refresh to improve the passenger accommodation. There is a Committed Obligation to assess the benefits of conversion to Bi-Mode operation (diesel/750v DC), which has been completed, but it is not intended to progress this. Additionally, the Class 444 and 450 fleets will go through an interior refurbishment to improve passenger accommodation.

Committed Obligations addressing Class 442 performance & reliability

CO34 commits SWR to upgrade the Class 442 units with a new traction package (motors, control and protection systems) and uprated braking system in order to address equipment obsolescence, age and reliability issues experienced in recent use.

The franchise delivery plan for the Class 444 and 450 fleets focuses primarily on an internal refresh of these units to improve the passenger environment, on-board customer information systems and reconfigure first class to increase passenger carrying capacity. The main improvements to be delivered by SWR in respect of these fleets are based upon enhanced maintenance practices and improved traction software on the Class 444 fleet which will address a short coming in the performance of these trains.

Committed Obligations addressing Class 444 performance

CO33.2 requires SWR to upgrade the traction software to allow the Class 444 units to achieve Class 450 section running times (which is the default timing load for Class 444 operated services).

10.3.5 Conclusions on fleet performance

The fleet employed by SWT, and more recently by SWR, is in the middle of an extended period of transition: reforming and refurbishing of the Class 458 fleet, retractioning of the

Class 455 fleet, transfer in of the Class 456 fleet, refurbishment of the Class 444 and 450 fleets, introduction of a new fleet of Class 707 units, re-introduction and refurbishing of the Class 442 fleet after an extended period of storage out of traffic, and finally, the planned introduction of an all-new suburban fleet to replace the Class 455, 456, 458 and 707 fleets.

Over this period of time the availability of stabling space has not kept pace with the expansion in fleet size, which has created significant additional logistical problems in manipulating the fleet for service and maintenance as appropriate. In addition, the facilities at Wimbledon Depot have been pushed to the limit to accommodate the extra work, exacerbated by 5-car units being introduced onto a railway where the stabling and depot facilities are laid out predominantly for 8-car or 12-car operation.

It is perhaps inevitable that there has been some impact on fleet availability and reliability. This has manifested itself in an increased rate of short formed services, increased defects such as air conditioning and toilets on trains in service, decreases in MTIN and some increases in delay minutes.

Given that the fleet size is now around a fifth bigger than it was a handful of years ago, it is not unreasonable to expect that, all other things being equal, delays attributed to fleet would have increased over this period.

It is clear that the fleet management team is aware of the size of the challenge it is engaged in, and has a set of actions under way which should lead to improvements over time. New siding space is also due to come on stream at Feltham, Woking and Fratton, which will go some way to easing the size of the current logistical challenge.

We therefore have no recommendations to make in respect of fleet.

Appendix A: Project Remit set 9th April 2018

Objective
To ensure all possible steps are being taken to improve performance of South Western Railway (SWR) rail services in order to improve the passenger experience.

Remit
Independently chair a review undertaken by SWR and NR of the possible steps that can be taken to improve performance of SWR rail services in order to improve the passenger experience. The chair will be supported in the review by external advisors already commissioned by SWR. Report weekly including to Secretary of State and Rail Minister on progress and any barriers to progress in implementation.

The review will cover three work packages:

Work Package 1 – due 29 June
To review with SWR and NR, in the context of the Alliance Agreement:

- what actions are needed immediately to improve SWR rail performance and passenger experience including actions to ensure closer working and more effective alignment between SWR and NR;
- the key risks to operational performance including as a minimum:
    - the reliability of infrastructure and rolling stock;
    - backlogs in relation to infrastructure and rolling stock maintenance; and
    - staffing levels in relation to key infrastructure and train operation roles;

with the intention of improving the management of such risks in the context of the findings of the review.

Produce a plan for the implementation of agreed recommendations and work with the management teams of SWR, NR and DfT to ensure this is delivered by 29 June.

Work Package 2 – Due 27 July
Identify and make recommendations as soon as possible on what further steps are needed to improve the management and performance of the Wessex network from across all of the industry partners involved, including in relation to:

- Objectives, incentives and performance metrics;
- Improving the overall passenger experience;
- Leadership, management structures and accountabilities;
- Work processes and team design and culture; and
- Contract specification and design.

Work Package 3 – Due end July (subject to alignment with NR timetable processes)
To review with South Western Railway and Network Rail the introduction of increased services planned in the Dec 2018 Timetable.

Identify the key risks to operational performance and delivery of the revised timetable, including resourcing issues, with the intention of improving the management of such risks in the context of the findings of the review.