OFFICE OF RAIL AND ROAD

# Network Rail Monitor

## Quarters 1-2 of Year 3 of CP5
## 1 April to 15 October 2016

24 November 2016

# Contents

# 1. Overview

## Health and safety

1.1 The first two quarters of 2016-17 have seen a continuation of last year's positive trend. Network Rail has, for the most part, delivered good safety management in challenging circumstances. Rising passenger usage, financial constraints and deferred renewal activity are all placing ever increasing demands on staff and greater reliance on maintenance and inspection activities. But against this positive background there have also been some incidents that illustrate the need for sustained, focused effort to maintain effective control of the risks to passengers, the workforce and the public.

1.2 Network Rail is on course to meet its year-end targets for reduction in Train Accident Risk and Workforce Lost Time Injuries. Measures for asset-related precursors to risk are, in many cases, on an improving trend and in some cases are at historically low levels. Network Rail has led the industry in seeking improvements to control of risks at whistle board level crossings during the 'night time quiet period' and within possessions where there are train movements.

1.3 Network Rail has responded positively to the findings of inspections carried out in 2015-16 and we have held discussions both centrally and in the routes aimed at driving further improvements in the company's management maturity. Its Safety, Technical and Engineering directorate is introducing revisions to its assurance regime and individual route management teams are devising more robust front-line assurance arrangements.

1.4 These improvements are necessary. In the majority of ORR inspections in the first two quarters of 2016-17 we found instances where Network Rail staff do not comply with the company's rules, procedures and engineering standards. We found that significant change was not consistently managed, jeopardising intended outcomes. Initiatives designed to improve worker health or the control of risk are not being fully implemented. Delays to ORBIS (asset information), Business Critical Rules (BCR) and Planning and Delivering Safe Work (PDSW) and other programmes mean that Network Rail has yet to realise the full benefits envisaged in its plans.

1.5 In some areas Network Rail appears to be relying on controls involving people and process, rather than 'hard' engineering. There have been two significant incidents in the first half of 2016-17 where it was only the very last line of defence that prevented a very serious outcome: *Grove Nook Lane (Barrow on Soar)* bridge collapse in August 2016 and *Hunton Bridge Tunnel (Watford)* cutting failure in September. In both instances it was only an emergency broadcast that avoided the worst outcome being realised.

1.6 *Hunton Bridge Tunnel* was particularly significant. ORR took enforcement action in August 2012 requiring the introduction of risk-based contingency arrangements in the event of extreme weather. Since that time, despite comparable levels of earthworks failures, there had been no train derailments – until the derailment at Hunton Bridge tunnel on 16 September 2016. Our investigation of the event continues.

# Train service performance

## Passenger

1.7 Performance in England and Wales in the first half of 2016-17 was poor, with Public Performance Measure (PPM) Moving Annual Average (MAA) declining to 87.7%, 2.2 percentage points (pp) below (i.e. worse than) Network Rail's internal target. The MAA for Cancellations and Significant Lateness (CaSL) was 3.7%, 0.8pp above (i.e. worse than) Network Rail's internal target.

1.8 We are starting to use Network Rail's route scorecards to inform our assessment of the company's performance. The scorecards, which have been developed jointly with Network Rail's customers – the train operators - measure the company's performance by route against a range of measures covering different areas, including train performance, safety and financials. The scorecards currently show Network Rail's delivery to most TOCs missing punctuality and reliability targets. In the second half of 2016-17 we will be focussing on holding Network Rail to account for its delivery to Govia Thameslink Railway (GTR), Southeastern, Virgin Trains East Coast (VTEC), South West Trains and Heathrow Express (HEx).

1.9 In the South East Route, GTR customers in particular have experienced train performance well below acceptable levels. This is partly as a result of traincrew and fleet issues which are outside Network Rail's direct control. However a significant proportion of delay is categorised as 'uninvestigated' and 'unexplained' which hinders Network Rail's ability to understand and address the underlying causes.

1.10 Across the network asset performance has generally improved but, contrary to expectations, punctuality and reliability have declined. This may be the result of shortcomings in the way services are recovered after incidents. Delays per Incident (DPI) can be a useful metric here. DPI has been increasing in recent years and Network Rail has described reducing it as a "must win".

## Freight

1.11 Performance for the freight sector was relatively strong. The Freight Delivery Metric (FDM) MAA at the end of the Period 7 stood at 94.0%, 1.5pp above the regulatory target of 92.5%. This was 0.5pp below Network Rail's more ambitious internal target of 94.5%.

## CP6 Performance measures

1.12 The industry has concluded that the current performance measures, while having many positive attributes, do have some limitations and that new measures need to be identified for the next Control Period (CP6) that will better reflect passenger experience of the railway in 2019.

1.13 The current measures (PPM and CaSL) provide simple "pass/fail" assessments, measuring punctuality at final destination. They also take no account of the numbers of passengers on the train. The industry has therefore identified a series of new measures, including:

- "On time" at all stations;
- Total and Average passenger lateness; and
- Cancellations.

1.14 There is a formal process (incorporating stakeholder consultation) governing the introduction of new performance measures. However, we expect to report on the emerging measures in future monitors ahead of their formal adoption so that we can develop a timely understanding of how these measures are working in practice and what messages they are providing.

# Asset management

1.15 So far this year Network Rail has delivered renewals on or ahead of plan in most areas, but plain line track renewal is 17% behind plan. This is mainly because of lost production by the high output track renewal fleet, particularly due to insufficient access to complete the work. Electrification work is well ahead of plan following acceleration of work in Kent and Wessex, and early completion of all work planned for this year in Scotland. Network Rail is forecasting to finish on or ahead of plan by the end of the year except for plain line track, where lost high output production cannot be recovered. The cost of renewals is 5% more than budgeted, mainly due to the loss of high output productivity and higher civils costs, and this is forecast to deteriorate to 9% more than budget by the end of the year.

1.16 Maintenance delivery is generally ahead of plan so far this year, although there continues to be significant variability. Areas currently behind plan are forecast to improve during the remainder of the year.

1.17 Asset performance has plateaued this year, after two years of improvement, with the Composite Reliability Index (CRI) currently 14.5% better than at the end of CP4. The recovery in telecoms performance has continued, as issues following the rollout of GSM-R are gradually resolved, but this improvement is offset by deterioration in earthworks failures, where the five-yearly moving average is now over 25% worse than at the end of Control Period 4 (CP4).

1.18 Alongside the Hendy re-plan, Network Rail reduced the volume of renewals it plans to deliver during the remainder of Control Period 5 (CP5), due to affordability constraints. We have been assessing the impact this will have on the network, and our findings are broadly consistent with Network Rail's own assessment. We expect some adverse effect on asset condition and asset performance across the network, particularly earthworks, drainage and structures. We also foresee a need for greater reliance on other safety controls in order to maintain asset safety. The volume of work for the specialist supply chain is likely to shrink in some areas, potentially impacting its ability to deliver the greater volumes required to recover in the medium term, particularly in track renewals, and increasing future costs.

## Developing the network

1.19 Network Rail has achieved seven out of eight planned project completion milestones in the six month period since the enhancements delivery plan was re-baselined in March 2016, following the Hendy re-plan. One notable success was the Uckfield train lengthening project, which allows longer trains to serve eight stations between Edenbridge Town and Uckfield. The new governance process agreed between Network Rail and the Department for Transport (DfT) (also in March 2016) has resulted in greater control of changes to enhancement projects, with a portfolio board approving any changes to ensure costs remain affordable within the CP5 borrowing limit.

1.20 The delivery of the CP5 enhancements portfolio continues to be challenging. Some future milestones have slipped backwards within the control period and cost pressures across the portfolio have required some difficult decisions for Network Rail and the Department for Transport (DfT) on scope that has been deferred to CP6. For example, there have recently been changes to the Great Western programme announced by the DfT. This underlines the need for Network Rail to realise the benefits of its *Enhancements Improvement Programme* (EIP) to keep costs and schedules under control.

1.21 Network Rail has made good progress with the EIP, with delivery of improved project management and implementation processes on-plan. Twelve months after Network Rail finalised the EIP, we are starting to see some of the new processes embedded in the organisation. These include the implementation of the new governance process with DfT to sustain an affordable England and Wales enhancements portfolio

and the commencement of a peer review process that has completed reviews of 14 projects or programmes since March. We have put processes in place to monitor the extent to which the EIP improvements are making a difference in project management. But we remain concerned that Network Rail itself does not appear to have a robust process to provide assurance around the EIP benefits.

## Expenditure and finance

1.22 For the full year, Network Rail expects to underspend its net budget by £3m. However, work not done and to be delivered beyond 2016-17 is forecast to be worth £503m (including £423m on renewals work, £69m on enhancements work and £11m on associated schedule 4 compensation payments for track possessions).

1.23 Taking this into account, for the work forecast to be delivered during the whole of 2016-17, Network Rail is expecting to underperform against its own budget by £295m on renewals (adjusted to £74m in line with the 25% sharing mechanism)[1] and £123m on enhancements (adjusted to £31m in line with the 25% sharing mechanism)[2].

1.24 The expected renewals underperformance is largely due to: less work being delivered by the high output plant; additional contractor claims; extra non-volume works; signalling delays and reduced volumes. It has also not delivered its planned efficiency initiatives. The enhancement underperformance is largely due to a range of factors including increased contract costs, supply chain constraints and access issues on Northern Hub, EGIP, East West Rail and on the rolling programme of electrification in Scotland.

1.25 There is also an underperformance against budget of £76m on associated schedule 8 compensation payments reflecting delays due to various infrastructure incidents such as flooding, landslips, fires and also some asset failures.

1.26 Following the company's classification to the public sector by the Office of National Statistics (ONS), Network Rail agreed to borrow from DfT instead of issuing bonds. The amount of new borrowing available from DfT is limited to £30.9bn across CP5 for Great Britain, after this was increased by £0.7bn following the Hendy Review.

1.27 Compared to its forecast at the start of CP5, Network Rail has spent more than it expected on the renewals and enhancements work it delivered in 2014-15 and 2015-16 and is forecasting to spend more on work to be delivered during 2016-17 as well.

[1] Network Rail generally retains 25% of any out/underperformance of the renewals and enhancement costs. This is consistent with our RAB roll forward policy.

[2] The interpretation of this variance now reflects the recommendations of the Hendy Report (November 2015) and the subsequent Enhancement Delivery Plan (EDP), which changed the baseline of the calculation of financial performance reflecting the increased anticipated final costs (AFC) for many enhancement projects.

It is also planning to spend more in the remainder of CP5. This means there is pressure on its borrowing facility with DfT.

1.28 Network Rail's latest business plan for Great Britain includes financial headroom of £0.2bn, for England and Wales and £0.1bn headroom for Scotland, i.e. it thinks it will not need to use £0.3bn of the borrowing facility. The main financial risks to this forecast include the costs of renewals and enhancements, delivery of efficiency initiatives, movements in interest rates and cash collateral balances, inflation and Network Rail achieving suitable strategies for generating additional cashflows through disposing of non-core assets and encouraging alternative funding arrangements.

1.29 Given the relatively small size of the headroom, it is important that Network Rail has a robust plan in place to deal with any further cost pressures. Given the scale of the above variances and that Network Rail in recent years has continually been too optimistic in forecasting its financial performance, we are concerned that its plan may not be sufficiently robust. Network Rail is fully aware of our concerns and we are discussing with the company how it would deal with further cost pressures.

1.30 Network Rail is continuing its investigation into the possible disposal of property related assets. ORR will consider the regulatory implications of any proposal put forward.

# 2. Health and Safety

2.1 The railway is a system and we focus on health and safety issues across the whole of it. This section of the Monitor reports on:

- Network Rail's performance against key health and safety indicators;
- the findings from our inspections and investigations of Network Rail; and
- other key issues.

Some of the issues we report on here are linked to other sections, particularly section 3 Asset Management.

## Performance against key indicators

2.2 The first two quarters of 2016-17 have seen Network Rail continue many of the positive trends of 2015-16. The workforce Lost Time Injury Frequency Rate (LTIFR) is currently within the trajectory to meet its end of year target. There are several initiatives designed to continue this positive trend, including introducing technology in road vehicles to reduce speeding incidents and accidents, and strengthening the 'Sentinel' card scheme to improve control of track access and prevent excessive working hours.

2.3 The reporting of close calls continues to exceed targets indicating an increased awareness of safety risk on the frontline. However, these higher volumes mean that the target for close-out within 90 days is currently 75% against the national target of 80%.

2.4 The passenger elements of the Precursor Indicator Model (PIM) for Train Accident risk, where Network Rail controls the risk are running below (i.e. better than) the CP5 target trajectory and are forecast to remain so. However improvement since early 2014-15 has plateaued. Of the component elements, Infrastructure Operations and Level Crossings are marginally above (i.e. worse than) target, and the contribution of earthworks has risen since this point in the previous year. Although Infrastructure Operations is still just missing the target, its contribution has reduced steadily all year from a point where it was significantly adrift. The reduction is primarily attributable to fewer incidents involving objects on the line. Future improvements are focussed on signaller competence and communications.

2.5 The level of risk from track events continues to show significant reduction. As a whole, track assets risk is well ahead of CP5 target and is forecast to deliver twice the level of expected reduction. Switches and crossings (S&C) faults, broken rails and broken fishplates have all reduced significantly. Fitment of tubular stretcher bars is on target. Period 7 saw a 22.2% reduction in the number of new and repeat twist faults compared to the same period in the previous year. Nationally, all twist faults

have improved by 19.5% since CP4 exit. Repeat twist faults have improved by 9.7% over the same period.

2.6 For Category A SPADs performance is now within the risk reduction target after a sustained period during which they were in excess of the CP5 target. We welcome the industry's new SPAD risk reduction strategy which will be launched in 2017.

2.7 2016-17 has so far seen 39 level crossing closures and six crossings downgraded in risk status. Period 7 saw two missed milestones in the level crossing risk reduction plan. This was due to factors beyond Network Rail's control and completion has been re-forecast. The forecast risk reduction by the end of the year is 18.7%, short of Network Rail's internal target of 20%. ORR continues to monitor Network Rail's level crossing risk reduction strategy to achieve the optimal improvements in safety. The need for this is illustrated by the rising number of incidents. The moving annual average for significant level crossing incidents is 10.5% worse than a year ago.

## Inspection and investigation work

2.8 Our inspections have been carried out in the context of reduced volumes of renewals (see the Asset Management section below) and a heightened focus on punctuality and reliability (see the Train Service Performance section below). We found that, in general, route and maintenance delivery unit asset management staff are making appropriate decisions about prioritising constrained resource – but do not always record the rationale for decisions and cannot always demonstrate what arrangements are in place to mitigate the risks of deferring renewals. There is not always a clear understanding of the consequential increased demands on maintenance.

2.9 Network Rail has responded to our 2015-16 inspection findings and is designing improvements to the delivery of its assurance regime. We do not expect to see instant improvements as a result but this work is a necessary step to achieving strengthened, sustainable safety management and for the successful delivery of Network Rail's *Strategy for Transforming safety and Wellbeing*.

## Track

2.10 Our inspections of maintenance delivery units have focused on judging the success of key initiatives that will sustain and improve Network Rail's positive performance in managing track risk precursors. We have examined the introduction of *Business Critical Rules* (BCR) for plain line track and the replacement of the *Assessment in the Line* competence management system with *Skills Assessment Scheme* (SAS). In both cases we have found implementation to be mixed. In the case of SAS, the post-implementation review was poorly structured and provided limited intelligence about the quality of implementation. All routes have adopted BCR for plain line track, and SAS, but our inspections showed variable understanding and application. This raises

a concern that some delivery units may struggle to maintain recent gains in performance.

2.11 We have escalated concerns with Network Rail about the management of poor track geometry at some sites. Our aim here was to encourage Network Rail to scrutinise track geometry management within its routes, to identify and address areas of weaker performance and to spread good practice. We concluded that frontline assurance was not working effectively and needed to be strengthened. As a result the Safety Technical and Engineering Directorate has put in place a plan to address process failings. We will continue to work with Route Managing Directors to promote more robust frontline assurance and enhanced monitoring and performance measures.

2.12 Track asset Temporary Speed Restrictions (TSRs) remain high and the number is increasing. In many respects this is a positive behavioural indicator: asset managers are no longer content to return sub-optimal track to normal line speed. But in many cases substantial remediation work is required to properly repair the root cause. Given the current financial and operating environment, this is not easily achieved as quickly as Network Rail would wish. A TSR reduction programme is however in place and we will be monitoring progress.

2.13 Emerging findings from our inspections of business plan revisions indicate that the majority of Track Maintenance Engineers (TMEs) are consulted on and involved in the deferral process and safety risk is being managed. However, the impact on existing maintenance activities is unclear. ORR will continue inspection activities in this area to support routes in finding improvements. We welcome Network Rail's new competence management system for TMEs as a step towards more predictably reliable professional engineering management across the network.

## Civils and Drainage

2.14 The Grove Nook Lane bridge collapse and the landslip and subsequent derailment at Hunton Bridge tunnel (Watford) show the vulnerability of civils assets to extreme weather. Both incidents have potentially national implications and ORR is investigating the circumstances. The cutting failure at Watford led to a train derailment – the first such event since ORR enforcement action in 2012 required risk-based contingency arrangements to mitigate the consequences of earthwork failure.

2.15 During the first half of 2016-17 ORR investigations of incidents from 2015-16 further illustrated the vulnerability of extreme weather controls. Our investigation of the landslips at Linslade and Wrecclesham revealed that earthworks, drainage, structures (e.g. culverts), and track assets are often managed in isolation, with little consideration of the performance of the 'railway' asset as a whole. We are encouraging Network Rail to adopt a 'system risk management' approach.

2.16 In the light of the Lamington viaduct failure at the end of 2015 we have continued to engage with Network Rail to ensure that suitable scour risk assessments have been carried out and appropriate mitigation or remediation actions put in place at vulnerable locations. As at 12 November Network Rail reported that there were 176 structures that may be at risk but which have no risk assessment. Of these, 49 are in LNE/EM Route and 52 in Wales. LNE/EM also has a significant number of structures (84 out of 315) that are currently assessed as high risk and require some further action to be taken. That total may increase as stage one assessments are completed. The only interim mitigation for these structures is to place them on the Flood Warning Database. We continue to work in this area to identify the extent of risk and to ensure Network Rail responds in a timely and effective manner.

2.17 We have scrutinised Network Rail's plans to defer some renewals within its Civils portfolio. These plans vary widely across the routes. In many cases, the rationale for deferrals has not been formally recorded, and interim mitigation measures are not always clear. We are currently undertaking site visits to review the effectiveness of the decision-making process and verify that mitigation measures are in place.

2.18 Network Rail is monitoring delivery of key elements of its Drainage Management Plans. The creation of the post of Professional Head of Drainage has brought greater clarity and coherence to the overall strategy for drainage assets. However, some routes are still in the process of identifying assets and despite this process reportedly having been completed some years ago it now appears that previous surveys have mainly collated visible (i.e. non-buried) assets. Additionally, all routes except Wessex Wales and Western are behind target for planned drainage work volumes delivery. This is work that the Professional Head of Drainage has confirmed is required to mitigate safety and performance risk.

2.19 Management of ancillary structures ranging from signal posts to station canopies and advertising hoardings remains a concern across the Structures and Buildings disciplines. Plans to improve the examination regime for these structures have been delayed due to route concerns about the resource implications. This is an area where it can be challenging to translate the ambitions of the central technical authority into consistently well-delivered actions at route and Maintenance Delivery Unit (MDU) level. We are monitoring this area actively.

2.20 Network Rail lacks a coherent strategy for implementation of remote monitoring technology for its earthwork assets. It is appropriate that routes seek effective mitigation of risk at assets whose renewal has been deferred – but we require assurance that this does not lead to the adoption of remote technology in situations when this may not be the optimal solution.

2.21 Some progress has been made to reduce the backlog of structures examinations, but this remains at unacceptable levels in some routes. LNE/EM and LNW routes are responsible for the majority of the backlog. At period 7, of the combined totals of 374 detailed and visual examinations in backlog, LNW and LNE/EM routes accounted for 348 items.

2.22 We also have concerns about LNE/EM Route with regard to earthworks examinations. Of the period 7 national total of 2127 overdue earthworks examinations, 2095 were on LNE/EM. Additionally, 121 of the national period 7 total of 122 earthworks without a hazard score are on LNE/EM. Further inspections are planned in the route to review the risk assessment and mitigation process for non-compliant structures and earthworks and to understand why this route seems not to have responded to regulatory concerns as well as other parts of the network.

## Electrification

2.23 Network Rail is undertaking the most significant programme of electrification in over a generation. This has brought significant challenges and our inspection activity has centred on electrification projects and schemes with a focus on improved control of risks. We have seen improved integration between planning and delivery on issues such as, bridge parapets, operating and maintenance strategies, overhead line design and isolation planning.

2.24 Electrical clearances remain a key issues for many projects, often because the physical environment makes control of risk difficult. Despite the challenging issues, we have seen Network Rail producing informed risk assessments underpinning option consideration. We have recently published guidance on electrical clearances, consolidating the advice we have been offering to individual schemes and Network Rail's central functions.

2.25 We have been closely monitoring the spend of ring-fenced funds for safer, faster isolations. Network Rail is trialling the single approach to earthing (AC) and isolation in LNW and Scotland. We have seen progress in terms of security of isolation but the efficiency benefits are not yet evident. Trials of a single approach began on the *Great Western Electrification Programme* (GWEP) in October 2016. In parallel, Network Rail centre is engaging with the routes to establish what hardware solutions can be installed to achieve safer, faster isolations by the end of CP5. The trajectory to achieving an AC solution is not yet completely clear, but the challenge is understood. The DC solution is more advanced, with three trial sites providing valuable intelligence on the safety and efficiency benefits of different types of equipment. Network Rail is confident that improved third rail arrangements will be in place by the end of CP5.

## Level Crossings

2.26 Our principal inspection activity in 2016-17 has been around the management of risk to users of passive level crossings equipped with 'whistle boards' (WBs). WB protected crossings require train drivers to sound the horn to provide warning to crossing users. We have carried out inspections in every route. We found very few examples of unmitigated or non-compliant crossings where inadequate warning is given. The condition of the asset could still be improved at some locations to give a quicker easier crossing surface. But we also found that Network Rail is improving its asset information on these crossings and compliance with standards to deliver appropriate warning time. There was good evidence of Network Rail identifying and trying to address any non-compliances. However, this was rarely by engineering means and usually involved requiring all users to telephone the signaller (where a phone is provided).

2.27 There were two main areas of concern arising from our work. One is that the sounding of a train horn is an unreliable means of warning crossing users; train drivers sometimes omit sounding the horn altogether or sound it at an incorrect location. The other concern relates to emerging findings that the extent of night time use is greater than was thought at the time the industry introduced the 'night time quiet period' (NTQP) during which train horns are not sounded at all at WB crossings. Evidence shows that the bulk of this use is concentrated during the hours at either end of the NTQP. As a result Network Rail is leading industry efforts to mitigate this increased risk by reducing the NTQP.

2.28 Network Rail has a long term strategy to ensure that there will be no crossings where the only control of risk is reliance on the user to decide it is safe to cross. In the short to medium term ORR is pressing for the introduction of complementary technology ("COVTEC") which sounds a warning at the crossing itself when a train approaches. The use of this technology is still not yet widespread, and commissioning delays continue.

2.29 We have been monitoring the CP5 £99m Ring fenced Funding for level crossing safety. The table below shows the expenditure and risk reduction achieved to period 5 of 2016-17 - year 3 of the control period. The fund is being spent to achieve the best risk reduction by:

- closing high risk level crossings;
- commissioning active warning systems at passive crossings; and
- commissioning power operated gates to minimise the number of times a vehicle driver needs to cross the railway and encourage gate closure.

| | Asset | Year 1 | Year 2 | Year 3 (to date) | Total |
|---|---|---|---|---|---|
| **Number of crossings closed** | | 35 | 12 | 10 | 57 |
| **Safety control improvements** | POGO | 1 | 6 | 1 | 8 |
| | COVTEC | 0 | 0 | 2 | 2 |
| **Total Spend (£m)** | | 6.5 | 14.6 | 4.2 | 25.3 |
| **% risk reduction** | | 2.460 | 0.149 | 0.764 | 3.373 |
| **FWI risk reduction** | | 0.3104 | 0.0188 | 0.0965 | 0.4257 |

## Worker Safety

2.30 The safest system of work for staff who have to be on or about the line is to be separated from train movements (commonly known as 'Green Zone' working). The busy nature of the network means this cannot always be achieved and staff continue to use systems of work relying on warning of any approaching train so they can move to a position of safety (commonly known as called 'Red Zone' working).

2.31 Levels of Red Zone working have reduced over the last two or three years, although there are some marked differences in performance between different routes, disciplines and depots. ORR inspections in the first half of 2016-17 identified more occasions where teams continue to use Red Zone working than we would like to see. Initiatives capable of making significant improvements in this area include enhanced planning and organisation, along the lines of LNE's '*safe and effective worksites*' programme, which makes maximum use of booked, standardised possessions for maintenance and repair activity. Our work has shown that this kind of approach offers both improved safety and business efficiency.

2.32 The faster introduction of technical innovations such as plain line pattern recognition and the negative short circuit device is much-needed. The former can eliminate a significant amount of Red Zone working. The latter can greatly increase productive time in possessions and line blockages. Other innovative, train approach-triggered, warning devices such as LEWIS and SATWS are welcomed, although in the medium term they are only likely to be fitted at key locations. These will be useful tools, but higher-order risk elimination methods, including green zone working, will remain the first and best choice.

2.33 With partial implementation in the East Midlands route, the *Planning and Delivering Safe Work (PDSW)* initiative appears to have "stalled" early in 2016. Under new leadership, important features of PDSW, including the single controlling mind, the quality of work leaders and their involvement in the planning process, are being carried forward in a revision of the existing *019 Track Worker Safety Standard*. This appears to be more realistic and deliverable than what went before. Greater emphasis is being put on engagement and consultation and Network Rail appears to be making positive progress towards securing better planned and safer track working. The 019 standard review should be seen as just one part of a much needed, thorough rationalisation of the way in which track work is planned and organised.

2.34 We have been scrutinising the response to continued issues regarding train movements within possessions. Existing rules and procedures have failed to prevent a number of collisions between trains within engineering possessions (for example at Logan in August 2015). Since then Network Rail has taken prompt action to lead cross-industry efforts to address this risk – a risk on its infrastructure but one whose mitigation depends on the actions of its contractors and companies supplying drivers of engineering trains. This work has led to the introduction over the summer of 2016 of clearer, safer rules regarding how trains travel through possessions and worksites. These will be formalised in the December 2016 Rule Book changes.

2.35 During the first two quarters of 2016-17 we have continued our work promoting greater safety for staff in depots electrified by third rail. This has been underway since the 2014 death of a train cleaner at West Marina Depot. Much of our effort has been with the train operating companies (TOCs) running such depots, but Network Rail, as asset owner and leasing body, has significant work to do to bring certain locations up to an acceptable condition to control workers' exposure to risk. It has been positive, however, in adapting designs for new sidings, to protect against fall and electrical risk.

# Other key issues

## Occupational health

2.36 Network Rail has continued to develop central policies and strategies on respiratory disease (including silica dust from ballast handling) and control of exposure to asbestos in non-buildings assets. Those policies and strategies on Hand-Arm Vibrations Syndrome (HAVS) have been completed. We have found progress slow in some areas, such as Face Fit Testing policy for respiratory protective equipment (RPE) and managing asbestos in non-buildings assets. In relation to manual handling, we have seen further evidence of non-compliance with the regulations and our inspections suggest that Delivery Units remain accepting of non-compliant lifting of bulky and very heavy loads. However, Network Rail is running a significant project with the aim of improving its approach and compliance.

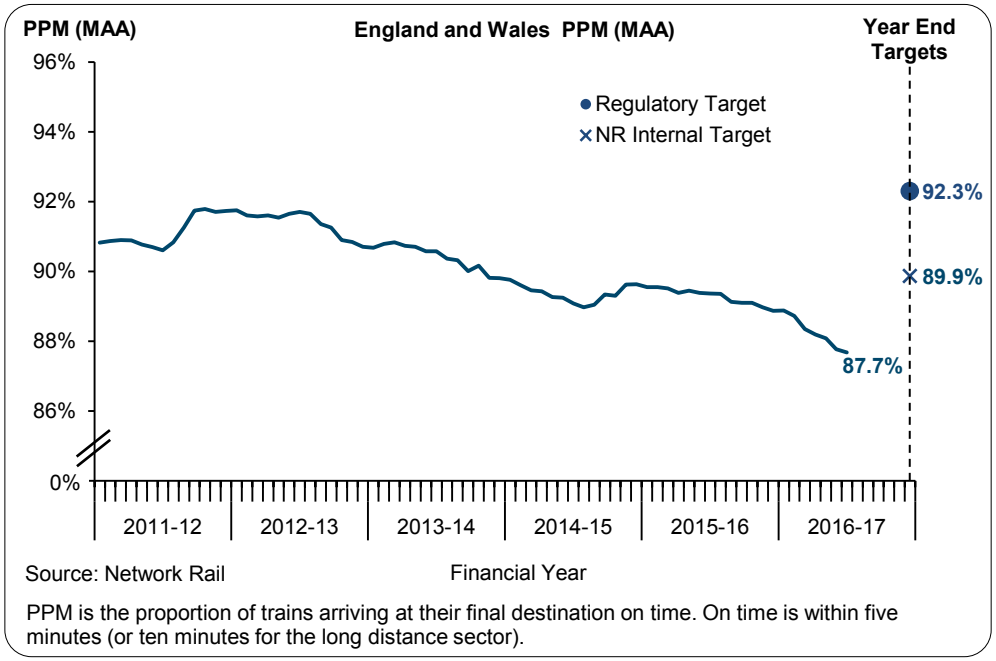
2.37 The loss of Network Rail's Head of Health and Wellbeing Strategy role has been felt in terms of a lack of co-ordination of route Occupational Health Managers. Although the company is in the process of appointing a Chief Medical Officer, ORR needs to see evidence that Network Rail's commitments to improving compliance with its legal obligations on health and protecting or improving the health of its employees has not become a lesser priority.

2.38 In the remainder of 2016-17 we will continue to encourage Network Rail to implement and embed its central policies and strategies at route level, focusing on HAVS, respiratory disease and manual handling. We expect to broaden our focus to other topic areas from 2017-18.

# 3. Train service performance

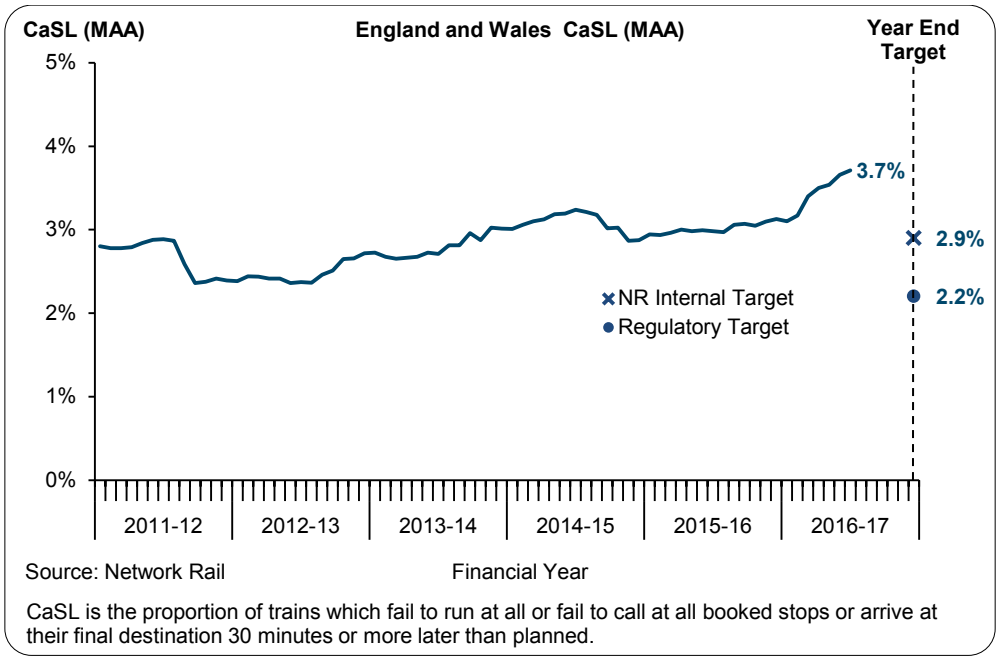
## National level performance

3.1 Train performance has declined significantly in the first half of 2016-17. At the end of Period 7 2016-17, PPM MAA was 87.7%, a decline of 1.2pp in the last 6 months. It is now 2.2pp worse than Network Rail's year-end internal target and 4.6pp worse than the year-end regulatory target.




PPM is the proportion of trains arriving at their final destination on time. On time is within five minutes (or ten minutes for the long distance sector).

3.2 At the same time, CaSL MAA is 3.7%, a 0.6pp increase in the last 6 months. It is now 0.8pp above (worse than) Network Rail's year-end internal target and 1.5pp worse than the year-end regulatory target.




## Factors behind the decline in performance

3.3 We are in regular dialogue with Network Rail and train operating companies (TOCs) so we can fully understand the recent downward trend in performance. We have also undertaken regular site visits to see at first-hand the challenges that Network Rail faces and how it plans to tackle them. At this stage our principal concerns are as set out below.

### 1. The performance of Govia Thameslink Railway (GTR)

3.4 At the end of period 7 GTR's PPM MAA had fallen to 76.0%, 8.0pp below its year end Performance Strategy target. This has a significant impact on national level performance as GTR operates 18% of services and accounts for 21% of passenger journeys made in England and Wales.

3.5 In its Southern operation, GTR has been impacted by industrial action by the RMT union, primarily over changes to the role of guards. There has also been a significant increase in sickness amongst these staff. As a result 'traincrew' is the largest single cause of PPM failures for GTR services. This makes the service harder to operate even when there are no other problems on the network, and when an incident does occur recovering the service is much harder. So, while Network Rail is responsible for 58% of delay minutes impacting GTR services, this is being made worse by GTR's traincrew problems. At the same time Network Rail's asset reliability has improved slightly. However, the average delay attributable to each incident, or 'delay per incident (DPI), is increasing. Network Rail describes tackling this as one of their 'must wins'.

## 2. Delay per incident (DPI)

3.6 Both TOCs and Network Rail must work together at a local level to reduce DPI. The infrastructure operator needs to improve its incident response, improving its performance against 'time to site' and 'time to fix' metrics. TOCs must provide adequate traincrew resource so the train service can recover more quickly and both Network Rail and the TOCs must have effective contingency plans.

3.7 Network Rail has a mix of short and long term initiatives to improve incident response, including increasing incident response staff resource and exploring technology such as the 'Incident Management System'. It is also looking at ways of improving its system operator capability, through timetable amendments, traffic management and reviewing train regulation policies.

3.8 Concentrating on any single metric of performance in isolation can give a false impression of overall performance, and lead to actions which do not improve the experience of the passenger.

## 3. Delay attribution

3.9 Compounding the problems with Network Rail's performance delivery to GTR is the issue of Delay Attribution (DA) on South East Route, in particular within the Sussex area. Normally a route would experience around 5-10% of delay minutes as unexplained, as it is not possible to attribute all incidents, particularly smaller delays. By the end of period 7 in Sussex, approximately 24% of the delay attributed to Network Rail had been categorised as "unexplained". This has, in part, led to 'Network Management/ Other' category being the largest source of delay minutes on South East Route.

3.10 The amount of delay being incurred has outstripped the route's capacity to attribute root cause. This results in an increase in uninvestigated delay, making it much harder to develop a coherent analysis of the causes of delay and put together effective action plans to improve performance. Network Rail has tried to increase resource to do this work, but the volume of delays and staff turnover have further increased. We are closely monitoring this issue and the company has committed to providing continuing resource to address concerns.

3.11 We have also observed that GTR is disputing a larger proportion of delay incidents than other operators. Although the TOC is fully entitled to do so, this pattern may indicate sub-optimal relationships at a local level.

## Our approach in year three of CP5 (2016-17)

3.12 We are holding Network Rail to account against for the delivery of the Performance Strategy targets, outputs that are locally agreed between the company and its customers (the TOCs). When these are aggregated at a national level, this becomes Network Rail's internal target: but the internal target is not a regulatory target.

3.13 We set a 'regulatory threshold', outside which we will consider further action. For PPM, this is 2.0pp below (worse than) Performance Strategy target, and for CaSL, this is 0.2pp above (worse than) the Performance Strategy target.

3.14 At the end of 2015-16, we considered regulatory intervention against Network Rail for its delivery to four TOCs which finished the year outside the regulatory threshold, even after TOC- caused delays were removed from the calculation. We decided to monitor NR's delivery for these TOCs in 2016-17 more closely. Of the four, Southeastern, Heathrow Express (HEx) and TransPennine Express (TPE) have seen performance move back within the regulatory threshold. GTR's PPM MAA has continued to decline.

# Delivery of performance at TOC level (excluding GTR)

## PPM

3.15 At the end of Period 7 four operators, (Virgin Trains West Coast (VTWC), TfL Rail, London Midland and Northern) were ahead of their Performance Strategy targets. With the exception of TfL Rail, all these operators have significant operations on LNW Route.

3.16 c2c again recorded the highest absolute PPM MAA score (95.3%), although this was 1.4pp down relative to performance at the end of 2015-16.

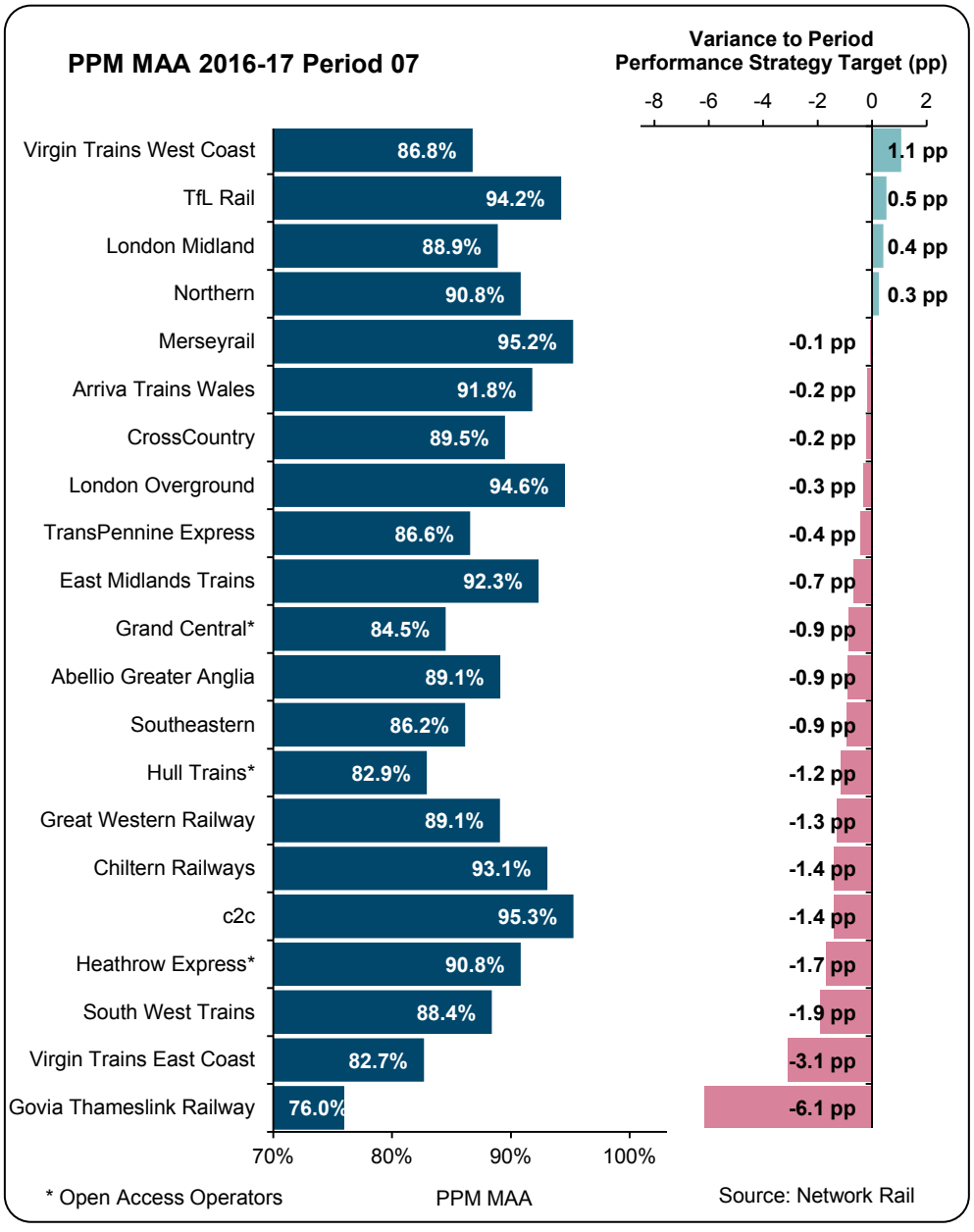
3.17 Other than GTR, the worst performer was Virgin Trains East Coast (VTEC). PPM has fallen to 82.7%, a decline of 2.5pp in the last 6 months. VTEC performance has been impacted by a number of infrastructure (particularly overhead line equipment (OLE) and fleet problems), as well as external events, so we are engaging the London North East (LNE) Route and increasing our scrutiny of Network Rail's delivery to the company.

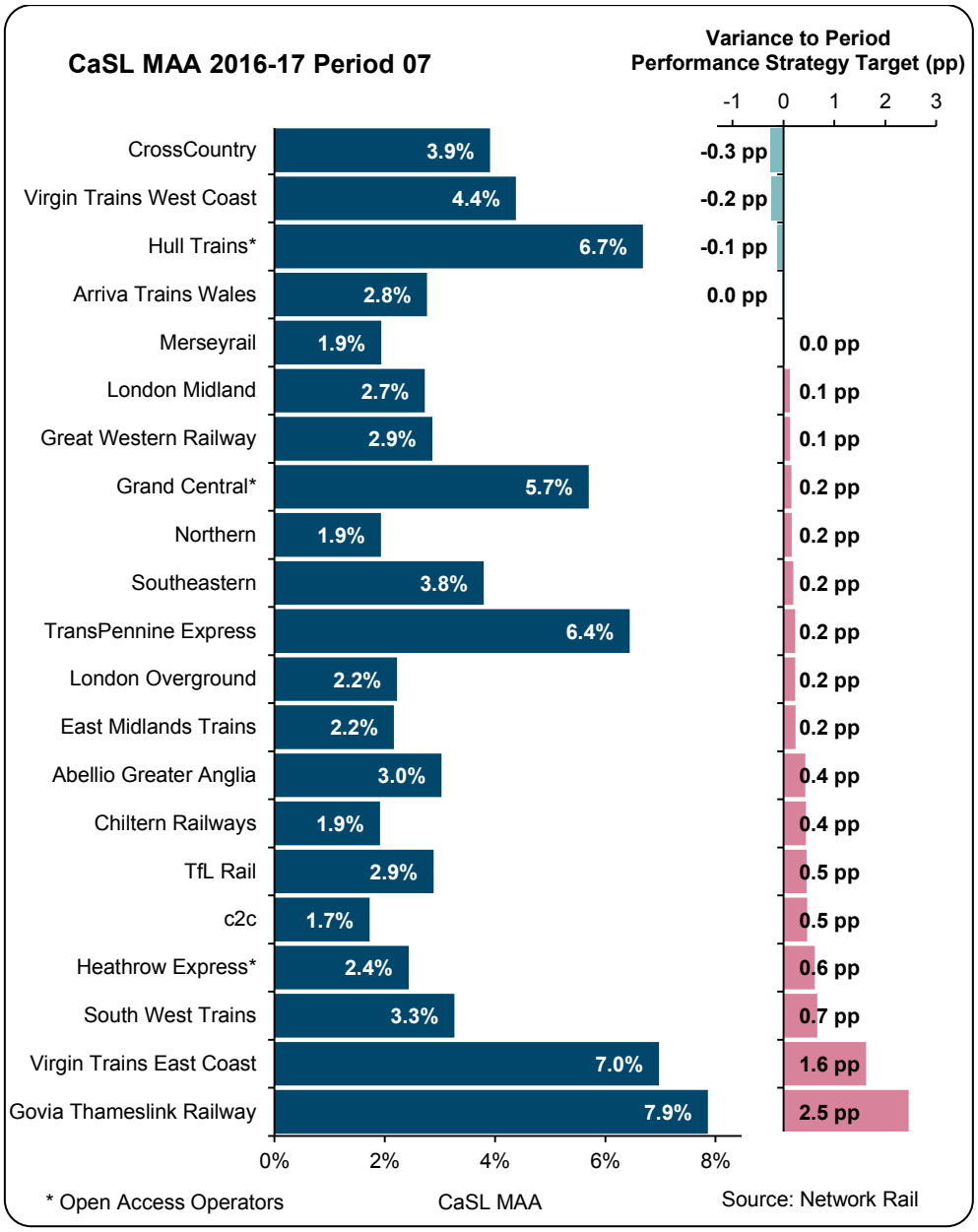
## CaSL

3.18 Three TOCs, CrossCountry, Hull Trains and VTWC were ahead of their Performance Strategy targets. c2c recorded the lowest (i.e. best) absolute CaSL result (1.7%) although this has increased (i.e. worsened) by 0.4pp in the last six months.

3.19 Nine operators were outside (i.e. higher and worse than) the regulatory threshold: c2c, Abellio Greater Anglia, East Midlands Trains, TfL Rail, TPE, HEx, South West Trains, VTEC and GTR.

3.20 The charts below show all operators' performance ranked by variance to their Performance Strategy targets at the end of period 7 2016-17.






## Route scorecards

3.21 Network Rail introduced Route Scorecards in 2016-17 to monitor its Key Performance Indicators and to align its train performance targets more closely with TOC requirements. Most TOCs have agreed a PPM and CaSL target, while some, e.g. VTEC, have set out a Right Time metric. Train Performance accounts for 20% of a route's overall score. We use the data in the scorecards as part of the evidence to determine whether Network Rail is doing everything reasonably practicable to achieve its regulated performance outputs.

3.22 Scorecards are at an early stage of maturity, and inevitably there are some areas that Network Rail needs to develop:

- Year-end forecasts – there is a lack of visibility of the methodology used to produce the year-end forecasts for agreed performance metrics. Improving these forecasts will increase the credibility of the metrics in the scorecard.
- Prioritisation of effort – When a KPI is irrecoverable; there is a possibility that effort may be diverted to other KPIs which can still be achieved. For example, on South East Route, GTR PPM/ CaSL and Network Rail delay minutes (which amount to 10% of the scorecard) are almost certainly going to be missed substantially. In these cases, we will need to be assured that this does not lead to diversion of effort to other areas.

# Other performance interventions and measures

## Delay minutes

3.23 We monitor Network Rail delay minutes as a key indicator of train performance. As the chart on page 28 shows, at the end of period 7 2016-17, 61% of delay minutes were attributable to Network Rail, 29% were “TOC on Self” (delays to a passenger train operating company's services caused by that company) and 10% were “TOC on TOC” (delays to a passenger train operator’s services caused by another train company). The position is broadly consistent with previous years.

## South East Reparations fund

3.24 In response to a previous ORR intervention, Network Rail instituted a reparations fund to improve performance in the South East Route. This includes a number of initiatives, such as more station staff at Network Rail managed stations, more focused asset management teams and investment in a new system to improve incident response. We are closely monitoring implementation of these schemes.

## London and South East resilience

3.25 Network Rail is also on course to complete further flood, high wind and cold weather mitigation schemes during 2017, funded through the London and South East resilience fund as well as coastal defence works at Folkestone Warren.

## Network capability

3.26 Network capability describes the capability of the network in terms of track mileage and layout, line speed, gauge, route availability and the amount of electrified track. Network Rail’s network licence requires the company to accurately describe and maintain (subject to network change) the baseline capability for which it is funded for the benefit of its stakeholders. For CP5, we said that the baseline capability of the network would be that in place as at 1 April 2014.

3.27 During the first half of the year we have become increasingly concerned about Network Rail's compliance with its network capability obligations with specific issues raised to us informally by industry stakeholders and through the industry's *Network Capability Steering Group* a forum for engagement between Network Rail and a range of industry stakeholders. We have not received any formal complaints from stakeholders, but it is important that train operators and funders are able to plan services and pursue commercial opportunities confidently. We have raised these concerns directly with Network Rail and through the steering group and asked the company to come up with proposals to address the issues raised to us by these stakeholders, making any changes of approach visible to them. Network Rail has acknowledged shortcomings in its procedures and is currently working on proposals for improvements. We expect to receive these proposals shortly.

### Network availability

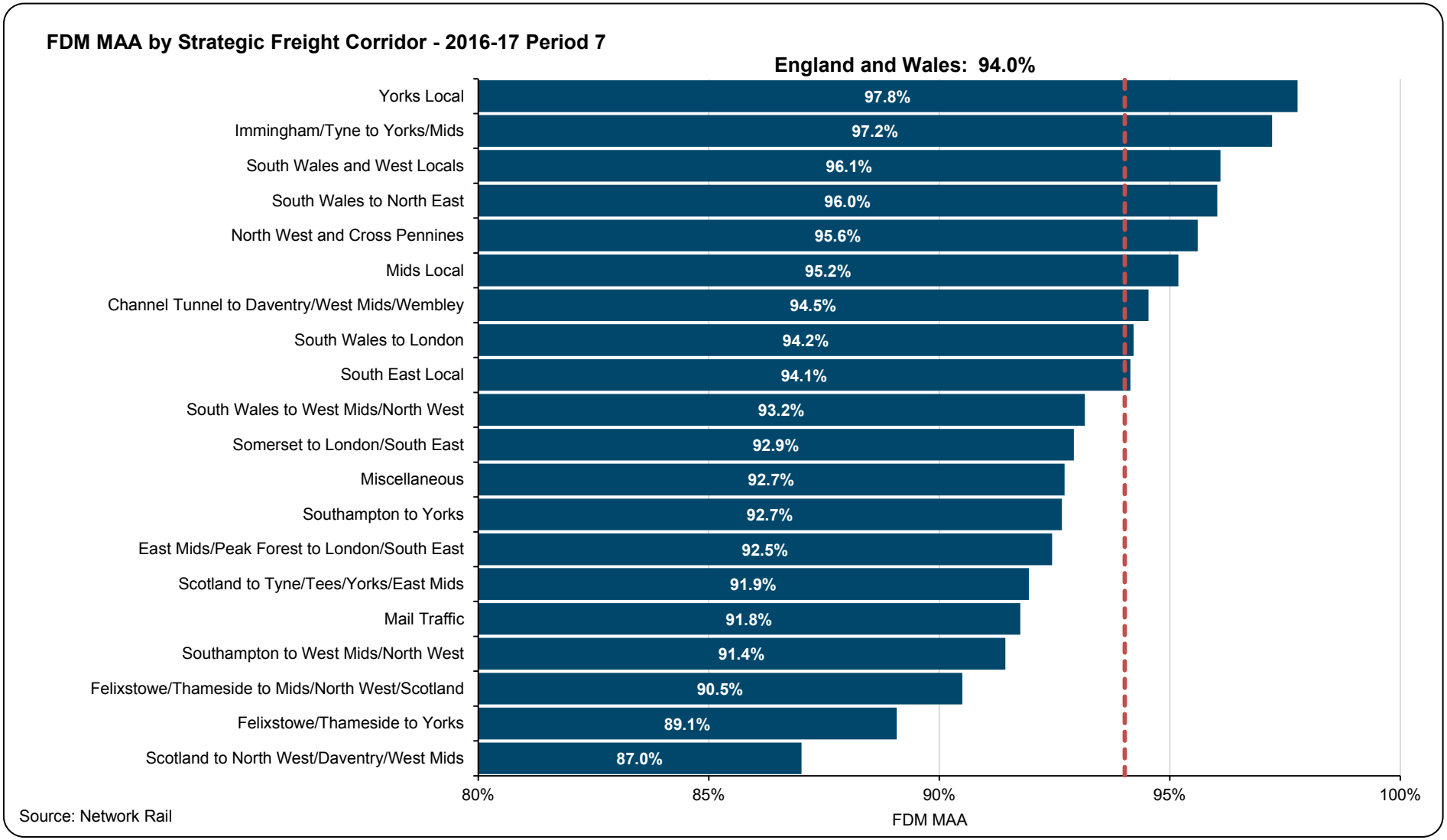
3.28 Network availability is a measure of the impact of planned engineering work on passengers and freight customers.

3.29 On the passenger side, Network Rail recommenced reporting on the Possession Disruption Index for Passengers (PDI-P) in January 2016, following a lengthy period during which the reports were unavailable. There are still some continuing problems with some aspects of the data including the service group definitions which need to be addressed.

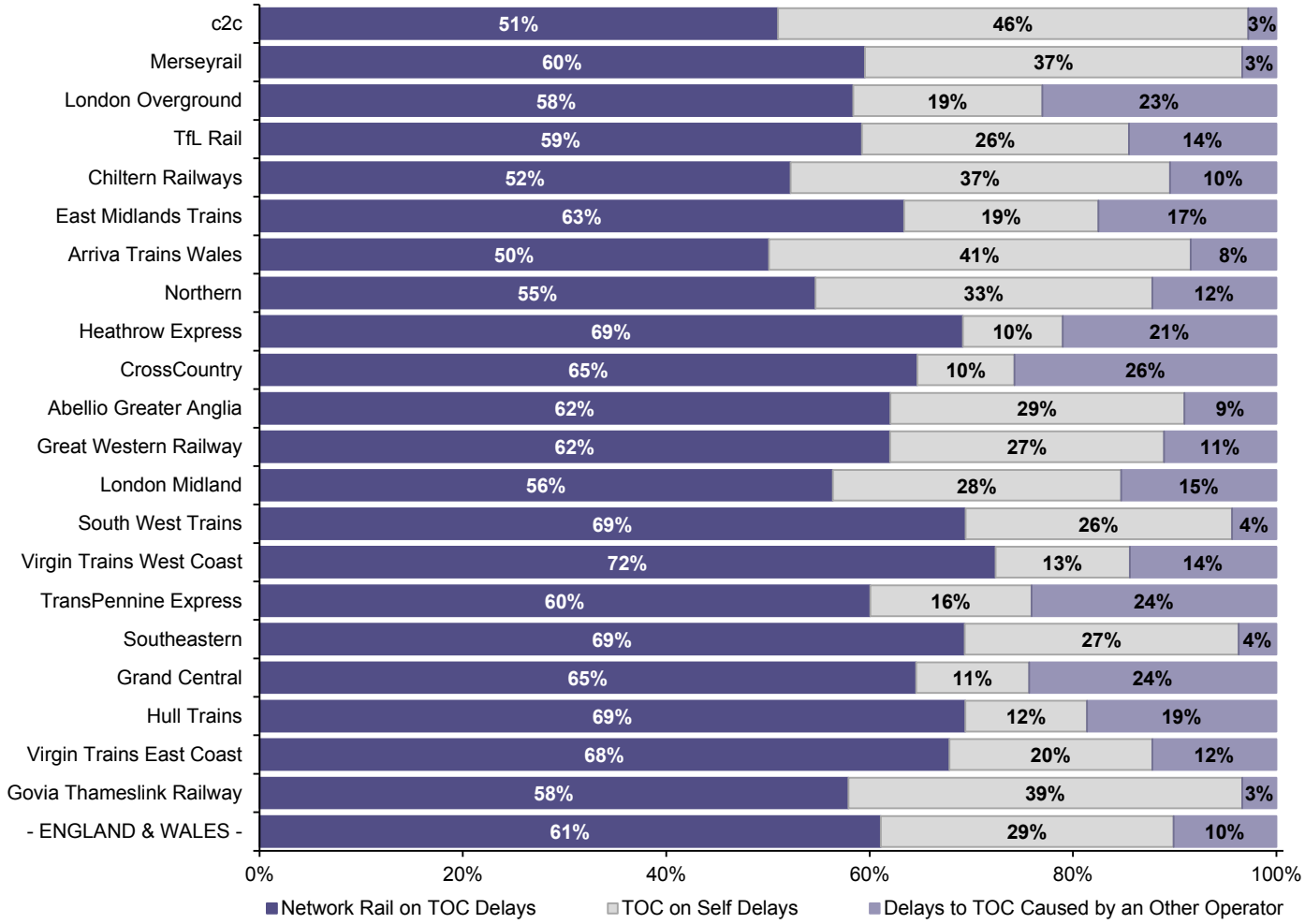
3.30 As far as freight customers are concerned, Network Rail is currently on track to meet its CP5 target for the Possession Disruption Index for Freight (PDI-F).

## Freight performance

3.31 The regulatory performance measure for freight is the Freight Delivery Metric (FDM). This measures the percentage of freight trains arriving at their destination within 15 minutes of scheduled time. FDM covers delays for which Network Rail is responsible - i.e. not those caused by train operators. The FDM at the end of period 7 2016-17 was 94.0%, 1.5pp ahead of the annual target of 92.5%. This was 0.5pp below Network Rail's more ambitious internal target of 94.5%.


FDM MAA by Strategic Freight Corridor - 2016-17 Period 7
England and Wales: 94.0%
Yorks Local
Immingham/Tyne to Yorks/Mids
South Wales and West Locals
South Wales to North East
North West and Cross Pennines
Mids Local
Channel Tunnel to Daventry/West Mids/Wembley
South Wales to London
South East Local
South Wales to West Mids/North West
Somerset to London/South East
Miscellaneous
Southampton to Yorks
East Mids/Peak Forest to London/South East
Scotland to Tyne/Tees/Yorks/East Mids
Mail Traffic
Southampton to West Mids/North West
Felixstowe/Thameside to Mids/North West/Scotland
Felixstowe/Thameside to Yorks
Scotland to North West/Daventry/West Mids
97.8%
97.2%
96.1%
96.0%
95.6%
95.2%
94.5%
94.2%
94.1%
93.2%
92.9%
92.7%
92.7%
92.5%
91.9%
91.8%
91.4%
90.5%
89.1%
87.0%
80%
85%
90%
95%
100%
FDM MAA
Source: Network Rail

**Proportion of Total Delay Minutes by Responsible Category: 2015-16 Period 8 to 2016-17 Period 7**




| | PPM MAA | CaSL MAA | Trains Planned (Rounded) |
|---|---|---|---|
| c2c | 95.3% | 1.7% | 125,200 |
| Merseyrail | 95.2% | 1.9% | 207,300 |
| London Overground | 94.6% | 2.2% | 500,000 |
| TfL Rail | 94.2% | 2.9% | 82,400 |
| Chiltern Railways | 93.1% | 1.9% | 141,800 |
| East Midlands Trains | 92.3% | 2.2% | 157,700 |
| Arriva Trains Wales | 91.8% | 2.8% | 325,600 |
| Northern | 90.8% | 1.9% | 865,700 |
| Heathrow Express | 90.8% | 2.4% | 49,800 |
| CrossCountry | 89.5% | 3.9% | 103,300 |
| Abellio Greater Anglia | 89.1% | 3.0% | 436,000 |
| Great Western Railway | 89.1% | 2.9% | 519,600 |
| London Midland | 88.9% | 2.7% | 420,600 |
| South West Trains | 88.4% | 3.3% | 592,100 |
| Virgin Trains West Coast | 86.8% | 4.4% | 103,300 |
| TransPennine Express | 86.6% | 6.4% | 84,200 |
| Southeastern | 86.2% | 3.8% | 640,800 |
| Grand Central | 84.5% | 5.7% | 6,300 |
| Hull Trains | 82.9% | 6.7% | 4,600 |
| Virgin Trains East Coast | 82.7% | 7.0% | 50,600 |
| Govia Thameslink Railway | 76.0% | 7.9% | 1,129,500 |
| - ENGLAND & WALES - | 87.7% | 3.7% | 6,546,400 |

Source: Network Rail

# 4. Asset management

## Delivery

4.1 Maintaining and renewing the network is fundamental to Network Rail's responsibilities. Regular maintenance counters the effects of wear and aging to keep the assets safe and performing as intended. But eventually they do have to be renewed when it becomes uneconomic or impractical to maintain them any longer.

4.2 Network Rail's approach to maintaining and renewing the network sustainably and at least whole life cost is set out in its asset policies. The volume of work required during CP5 in accordance with these policies was set out by Network Rail in its 2014 delivery plan and subsequent updates. As well as looking at the reliability of assets by type we monitor the actual volume of work delivered to understand whether Network Rail is doing enough to sustain the network.

## Renewals

4.3 During the first year of CP5 (2014-15) the volume of renewals projects completed by Network Rail was significantly less than planned. The situation improved last year to finish on plan overall except in some areas of civils renewals, but we were concerned that a significant proportion of the renewals spend planned for 2015-16 was deferred to future years, particularly in signalling and civils, which are often multi-year projects.

4.4 So far this year Network Rail is ahead of plan on civils renewals (7% ahead on underbridges, and 78% ahead on earthworks), as a result of completing projects that were not finished as planned at the end of last year. Signalling renewal schemes and switch and crossing renewals have been completed as planned, but plain line track renewal is 17% behind plan. This is mainly because of lost production by the high output track renewal fleet, particularly due to insufficient access to complete the work. DC conductor rail renewals are 75% ahead of plan, reflecting acceleration of work in Kent and Wessex, and overhead line renewals are 97% ahead of plan following early completion of all work planned for this year in Scotland. Network Rail is forecasting to finish on or ahead of plan by the end of the year except for plain line track, where lost high output production cannot be recovered.

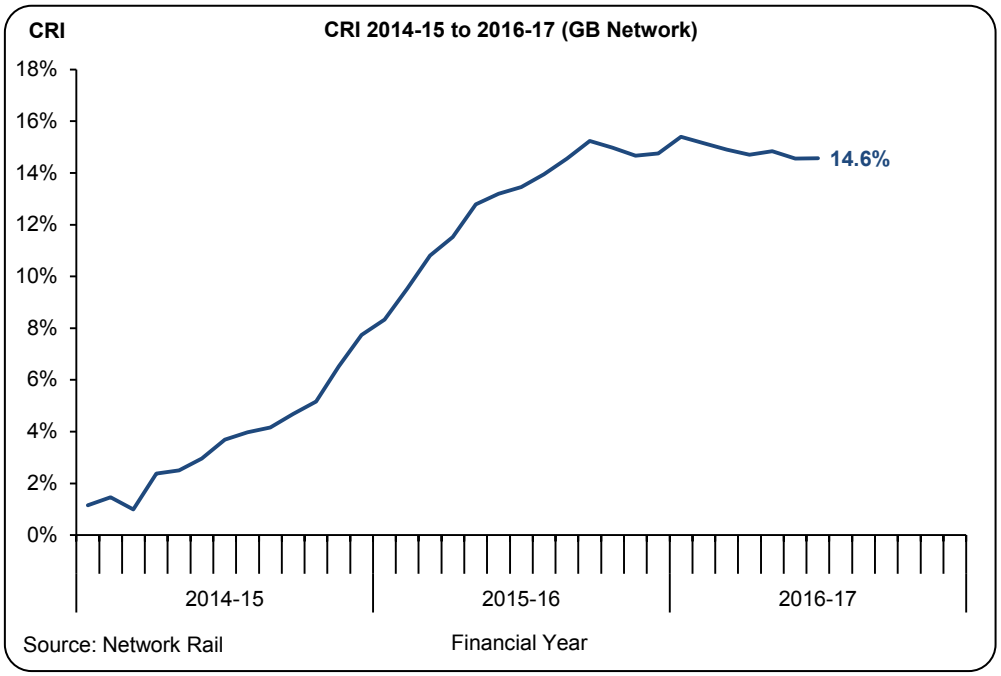
4.5 The cost of the renewals work delivered so far this year was £68m (5%) more than budgeted, mainly due to the loss of high output productivity and higher civils costs. Network Rail is forecasting for this to deteriorate to £295m (9%) more than budgeted by the end of the year.

# Maintenance

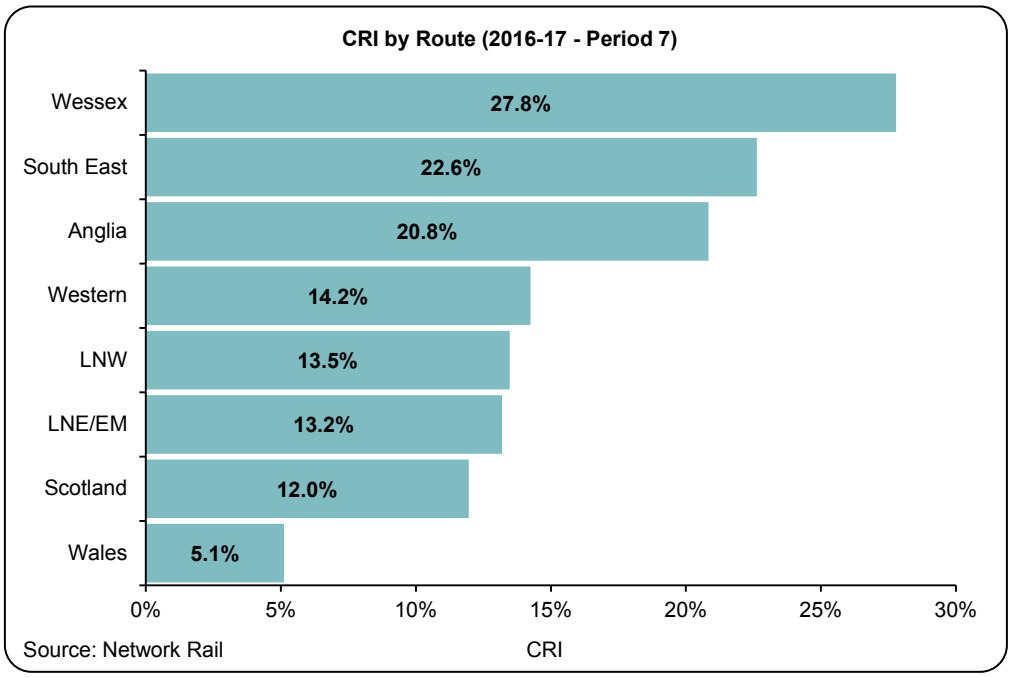
4.6 Maintenance delivery is generally ahead of plan, although there continues to be significant variability in some areas. For example, in track maintenance, manual wet bed removal, correction of track geometry, and replacement of pads and insulators are well ahead of plan, but mechanical wet bed removal, stoneblowing, and tamping are behind plan. In electrification, maintenance of conductor rails, DC traction supplies, overhead line components and points heaters are all well ahead of plan, but maintenance of signalling power supplies is behind plan. This overall picture is set to continue through to the end of the year, but with Network Rail forecasting improvement in areas currently behind plan. For example, drainage maintenance is currently 37% behind plan, but is forecast to recover to less than 9% behind plan by the end of the year. The cost of maintenance delivery so far this year is 2% more than budget.

# Asset Performance

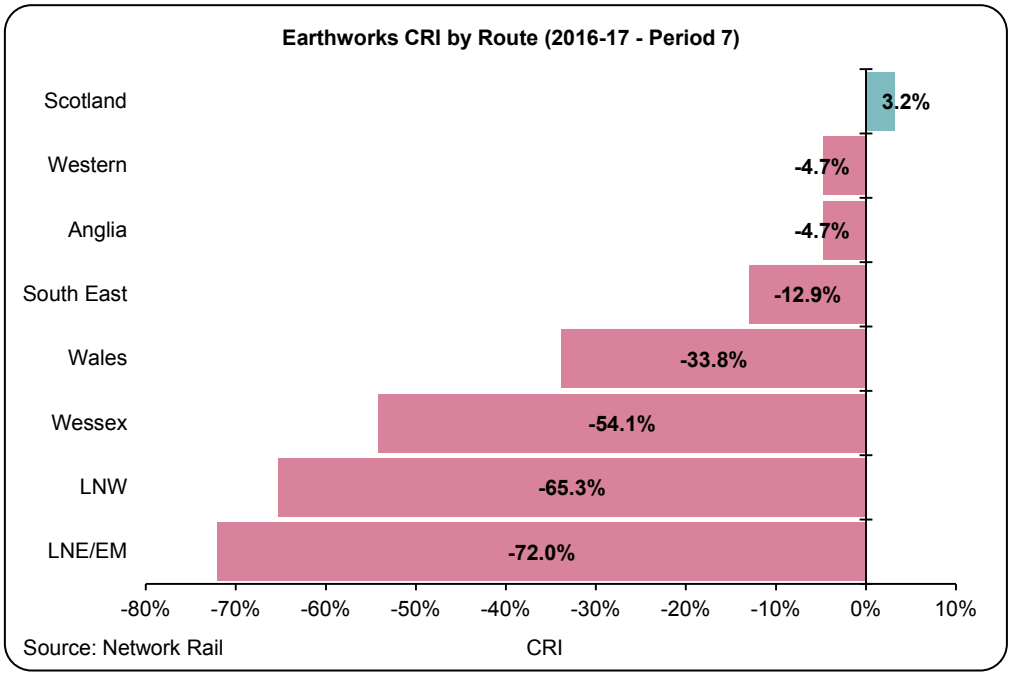
4.7 During the first two years of CP5, Network Rail succeeded in reducing the incidence of service-affecting asset failures, with the Composite Reliability Index (CRI) showing a 14.8% improvement relative to the end of CP4, which was well ahead of plan. So far this year asset performance has plateaued, with CRI falling slightly to 14.6%, and Network Rail is forecasting CRI to remain at about this level through to the end of the year.



4.8 The improvement in asset performance since the end of CP4 is variable at route level, ranging from 27.8% in Wessex route to 5.1% in Wales.




4.9 The recovery in telecoms performance has continued this year, as issues following the rollout of GSM-R are gradually resolved, and performance is now back to where it was at the end of CP4. This improvement is offset by deterioration in earthworks failures, where the 5-yearly moving average is now more than 25% worse than at the end of CP4, contributing -1.0% to network CRI. All routes except Scotland, Western and Anglia have suffered significant deterioration.



## ORBIS milestones

4.10 ORBIS stands for *Offering Rail Better Information Services*. It is an ambitious programme aimed at improving asset management capability through improved information management. It involves adopting consistent data specifications, providing simpler mobile data capture tools, replacing out-dated asset information systems, and providing improved decision support tools. For CP5 we set specific milestones to help ensure it delivers all the benefits expected.

4.11 To date Network Rail has met all of these milestones with one exception. That was the June 2016 milestone for replacing the existing *Civils Asset Register and Reporting System* (CARRS) with a new Ellipse-based asset management system for civils structures known as CSAMS. This was due to delay associated with upgrading to Ellipse 8. CSAMS will not be available before the beginning of the winter programme of asset inspections, so Network Rail is now aiming to launch it in May 2017. We are considering the potential impact of this missed milestone on Network Rail's stakeholders before determining whether formal action is appropriate. The delay is being taken as an opportunity to enhance the capability of CSAMS, for example, enabling engineers to compare individual assets with the portfolio of similar assets. From our preview of the system, we anticipate it will be a major step forward.

## Deferred Renewals

4.12 Alongside the Hendy re-plan for the enhancements portfolio, last year Network Rail reduced the volume of renewals it planned to deliver during the remainder of CP5 due to affordability constraints. To assess what impact this will have on the network we have liaised with Network Rail's route teams to understand how their plans have been affected, and to see items that have been deferred or de-scoped. Our findings broadly agree with Network Rail's central review. We expect some adverse effect on asset condition and asset performance across the network, particularly earthworks, drainage and structures. We also foresee a need for greater reliance on other safety controls in order to maintain asset safety. The volume of work for the specialist supply chain is likely to shrink in some areas, potentially impacting its ability to deliver the greater volumes required to recover in the medium term, particularly in track renewals, and increasing future costs.

# 5. Developing the network

5.1 As reported in the last monitor, Network Rail completed a re-planning exercise in November 2015 called the Hendy review. The purpose was to establish a re-scheduled plan of England and Wales project milestones that would be deliverable and affordable in CP5. Network Rail reflected the outcome of the Hendy review in a revised enhancements delivery plan, published in March 2016. This delivery plan sets out Network Rail's obligations to its customers and rail users for enhancement projects in CP5, and we have been monitoring the organisation's progress against this plan as set out below.

## Delivery progress

5.2 Network Rail delivered seven of eight project completion milestones it planned to deliver, since the March 2016 enhancements delivery plan was published. This includes the on-time completion of platform extension works at Uckfield, increasing capacity for passengers by allowing longer trains to use this station. Network Rail also completed lightning mitigation works between Waterloo and Clapham. This was the first scheme to be completed using the £25m London and South East resilience fund, which Network Rail committed to when we found it in breach of its licence in July 2014.

5.3 The only project completion milestone Network Rail missed was the introduction of mobile maintenance trains, as they are still to be introduced on the London North East and South East routes. The project has delivered these new systems at six locations, allowing maintenance staff to work in a safer environment when completing on-track activities, with opportunities for more efficient and productive working.

5.4 Between April 2016 and September 2016, Network Rail completed eleven development milestones on schedule, against a total of 12. The missed milestone was Highland Main Line Journey Time improvements project (Phase 2), which we have commented on in the Scotland monitor. We have published a complete list of milestones due for completion in the last six months showing those which have been completed missed or revised.

## Projects at risk

5.5 Electrification of the Great Western mainline is the highest profile programme at risk in the England and Wales portfolio of enhancement projects. As described in the last monitor, productivity on site has increased. Network Rail completed works on a new test track between Tilehurst and Didcot by the end of September 2016. However, the original scope of works planned for the test track was not completed by this date.

5.6 Network Rail has shared risk assessments that provide confidence it has a robust programme to meet the next regulated output, to deliver the infrastructure to enable electric trains to run on the line from Maidenhead to Didcot by December 2017. However, given Network Rail's previous delivery performance for this programme, we consider risks remain to the schedule and it is imperative that Network Rail actively manages these issues with effective mitigation plans if the milestones are to be achieved.

5.7 As reported in the last monitor, the Hendy review re-planned many project dates to be more achievable, however delivery and cost challenges remain. For example, increased cost pressures for the Great Western programme since the Hendy review have resulted in DfT and Network Rail agreeing to defer the following four sections of electrification to make sure the total costs of enhancements stays with the funding envelope.

- Oxford and Didcot Parkway
- Filton Bank (Bristol Parkway to Bristol Temple Meads)
- West of Thingley Junction (Bath Spa to Bristol Temple Meads)
- Thames Valley Branches (Henley and Windsor)

5.8 The recently published report into the Great Western Programme by the National Audit Office, highlighted several issues with Network Rail's cost estimating and delivery of the programme. A lot of these issues identified, such as poor cost estimating and lack of a robust industry programme approach, reaffirm the issues we identified when we found Network Rail in breach of its licence in October 2015. This further reinforces the need for the Network Rail's Enhancements Improvement Programme (EIP) to deliver its planned benefits that if delivered effectively should result in improved management and delivery of large programmes.

# Changes to future milestones

5.9 Changes to the England and Wales enhancements portfolio now require Network Rail and DfT approval at a portfolio board. This is part of a governance process that allows the affordability of the total portfolio of enhancement projects to be considered when making changes to the cost, outputs or schedule. ORR approval is required for any change to Network Rail's obligations to its customers, as described in its regulated outputs in the enhancements delivery plan. Our decision letters can be found on our website. We have highlighted two projects below, where changes have raised concern regarding Network Rail's future delivery of outputs to its customers.

## Waterloo

5.10 Network Rail agreed with DfT to change the outputs and scope of the Waterloo project to remain within the funding envelope of the Hendy re-plan. The main change

to the output is the deferral of works to ease passenger congestion at Surbiton station. We will follow this up through our normal safety monitoring processes, to determine if the delay to this project will have an impact on passenger safety at this station in the future. South West Trains supported the changes but requested the power enhancement works on the Windsor lines are completed by autumn 2020. This timescale will be challenging for Network Rail and we will be scrutinising its plans to deliver to schedule.

## Bromsgrove electrification

5.11 The forecast completion of Bromsgrove electrification project has now slipped from April to November 2017. Network Rail missed its original target to complete this project in December 2013. This lengthy delay is well below expectations, particularly as the new station was funded by third parties on the basis of a more frequent train service which is now unlikely to commence until May 2018.

# Enhancements Improvement Programme (EIP)

5.12 It is approximately a year since Network Rail re-baselined a final version of the EIP, in response to our October 2015 decision that the company was in breach of its licence regarding its management and delivery of enhancement projects. During the year Network Rail has generally made good progress against its schedule of improvement activities. But it still faces challenges to make sure these activities are effectively implemented, embedded in its programme and the benefits are delivered. A summary against each of the seven EIP workstreams is set out below:

## Clienting and governing the enhancement portfolio

5.13 As described in the previous section, DfT and Network Rail agreed a Memorandum of Understanding (MoU) on rail enhancements in response to recommendations in the Bowe review[3]. Network Rail has instigated processes to put this MoU into action. This includes setting up an enhancements portfolio board (attended by DfT, Network Rail and ORR), reporting regular standardised portfolio information and agreeing a portfolio change control process with DfT. The change control process means any change to programme output, cost baseline or schedule, needs to be approved by the portfolio board, meaning the impact on the overall affordability and benefits delivered can be managed at portfolio level.

[3] See - Report of the Bowe Review into the planning of Network Rail's Enhancements Programme 2014-2019 – November 2015

## Project sponsorship and transition management

5.14 This workstream will improve the competency of project sponsors across Network Rail. The workstream has been affected by delays, primarily to allow for the recruitment of a suitably qualified candidate for the critical new Head of Sponsorship role. The role which has responsibility for driving improved sponsor capability has now been filled and we expect the plans for this workstream to be firmed up with significant progress over the next few months.

## Cost planning, estimating risk and value management

5.15 This workstream is essential to improving the quality of project estimates throughout the project lifecycle and should deliver more robust estimating to support the periodic review process. There have been some minor delays. However, an estimate management plan has been developed and guidance to ensure consistent application of estimating tolerance at stages through the project lifecycle has been produced.

## Project governance and gateway assurance

5.16 Network Rail has now started implementing peer reviews - short focused reviews undertaken at key decision points in the GRIP project or programme lifecycle. These are undertaken by Network Rail staff who are independent from the project team and business unit responsible for the successful delivery of the project/programme.

5.17 Several project peer reviews have been completed and an independent review of the process has found it to be robust. Around 30 to 40 project or programme peer reviews are planned each year.

### Project portfolio monitoring

5.18 This workstream is implementing a new project portfolio monitoring system. This system is planned to deliver new ways of monitoring project and programme performance for Network Rail projects. The intention is to change the emphasis from reactive reporting to proactively examining measures such as future schedule and detailed analysis of project's safety performance. The system has been demonstrated at a number of Network Rail routes, but will not go live until early 2017, when the functionality to report on critical resources, risk and possession efficiency will be added.

## Project delivery capability

5.19 Network Rail has created a programme, commercial and development function in its Investment Projects directorate. This function will provide a more structured approach to improving the capacity and capability of its people for these aspects of programme management. As part of this workstream, critical resource supply and demand modelling has also been completed. This will be essential in planning for the long-term workbank into the next control period.

## Safety by design

5.20 Network Rail is currently finalising a *Safety by Design* policy to be issued early in December 2016. The policy aims at reducing the future safety risk to track workers when new infrastructure is designed. To see evidence of these improvements being implemented we have recently witnessed the application of safety by design principles in a technical stage gate for the Werrington project. Although we had some concerns about how the processes could be applied consistently to future projects, we saw clear evidence that the new processes were being applied here.

## Station costs

5.21 The Welsh Assembly and Transport Scotland raised concerns with us earlier in CP5, regarding the cost of station projects delivered by Network Rail when compared to the cost of station projects delivered by third parties. We commissioned the independent reporter Arup to complete a review to collate cost information from station projects delivered by Network Rail and other parties. Unfortunately this review was inconclusive in terms of a comparison of the costs, as the third party deliverers could not provide the cost information at a consistent level of detail to enable a robust assessment. However, it did provide some indicators that Network Rail-delivered station works were in line with expected benchmarks and therefore evidence that these costs can be considered to be efficient for this sample of projects. The review report will be published once it has been completed.

# 6. Expenditure and finance

## Overall financial performance

6.1 We consider Network Rail's financial performance in two different ways; firstly by providing (in the tables below) a simple comparison of spend against its own budget and secondly by considering our regulatory performance measure.

## Expenditure and financial performance

**Table 1: Income and expenditure for Great Britain in 2016-17 – a simple comparison of all Network Rail income and expenditure**

| £m | Period 6 2016-17 | | | Full year | | |
|---|---|---|---|---|---|---|
| | Budget | Actual | Variance b/(w) | Budget | Forecast | Variance b/(w) |
| Turnover | 3,100 | 3,094 | (6) | 6,784 | 6,771 | (13) |
| Schedule 4 | (126) | (112) | 14 | (308) | (299) | 9 |
| Schedule 8 | (14) | (59) | (45) | (104) | (180) | (76) |
| Operations | (244) | (234) | 10 | (552) | (553) | (1) |
| Support | (499) | (424) | 75 | (1,049) | (1,033) | 16 |
| Maintenance | (582) | (582) | 0 | (1,258) | (1,269) | (11) |
| Capex - Renewals | (1,547) | (1,323) | 224 | (3,237) | (3,110) | 127 |
| Capex - Enhancements | (1,750) | (1,650) | 100 | (3,904) | (3,958) | (54) |
| Financing costs | (745) | (735) | 10 | (1,748) | (1,748) | 0 |
| **Total** | **(2,407)** | **(2,025)** | **382** | **(5,376)** | **(5,379)** | **(3)** |

6.2 In the first six periods of 2016-17, Network Rail underspent its own net budget by £382m. For the full year, it expects to overspend by £3m largely because for the full year there is:

- £127m lower renewals expenditure. Lower volumes have been delivered than expected (the value of the renewals that have not been delivered is £423m) and this work will be delivered at a later date (see Table 2 below). Taking this into account the cost of the work Network Rail has done was £295m higher than expected (adjusted to £74m in line with the 25% sharing mechanism[4]). This is largely due to less work being delivered by high output plant; additional contractor claims; extra non-volume works; signalling delays and reduced volumes. It has also not delivered its planned efficiency initiatives;
- £54m higher enhancements costs. Lower volumes have been delivered than expected (this work is valued at £69m[5]) and will be delivered at a later date.

[4] Network Rail generally retains 25% of any out/underperformance of renewals and enhancements cost. This is consistent with our RAB roll forward policy. So for renewals, the amount included in financial performance is £74m = £295m x 25%.

[5] The interpretation of this variance now reflects the recommendations of the Hendy Report (November 2015) and the subsequent Enhancement Delivery Plan (EDP), which changed the baseline of the calculation of financial performance reflecting the increased anticipated final costs (AFC) for many enhancement projects.

The cost of the work Network Rail has delivered was £123m (adjusted to £31m in line with the 25% sharing mechanism) higher than expected. This was largely due to a range of factors including increased contractor costs, supply chain constraints and access issues on Northern Hub, EGIP, East West Rail and on the rolling programme of electrification in Scotland;

- There is also an overspend against budget of £76m on associated schedule 8 compensation payments reflecting delays due to various infrastructure incidents such as flooding, landslips, fires and also some asset failures. All of this has been recognised as financial underperformance.

## Regulatory financial performance

6.3 We also use our regulatory performance measure to monitor Network Rail's performance against our CP5 Final Determination. The steps in our calculation are shown in Table 2 below. This measure provides a better calculation of Network Rail's performance because it:

- excludes certain types of income and expenditure that are not as controllable by Network Rail. These include network grant, fixed track access charges, traction electricity income and costs and business rates;
- ensures that Network Rail does not benefit by simply delaying work to a later date as it is just a timing difference, i.e. the work still needs to be done in the future;
- we adjust the out/under performance on renewals and enhancements to be consistent with our RAB roll forward policy. We do this by limiting the financial reward/penalty to generally 25% of the under/overperformance. For example in Table 2 below, the gross enhancements underperformance for the first six periods is £49m, so we limit it to 25% by deducting 75% in the line "Capex adjustment – Enhancements", i.e. £37m = £49m x 75%; and
- Network Rail should not benefit by not delivering its outputs, so we adjust for the value of the output not delivered.

6.4 We currently expect Network Rail to underperform the regulatory performance measure by £1,025m in 2016-17 as shown in Table 2 below. This is because:

- Network Rail's forecast financial performance for the full year is £211m adverse to its own budget. This is largely because, compared to its own budget, it has underperformed on Schedule 8 compensation payments (£76m), renewals (£74m) and enhancements (£31m) as explained above;

- Network Rail's 2016-17 budget is itself £635m worse than our determination. This is due to lower planned efficiencies and higher unit costs than previously assumed across most core business activities; and
- Network Rail has estimated that we will make £179m of adjustments for its under delivery of the PPM and CaSL train performance regulatory outputs in 2016-17. We will review this at the end of the year, so the final adjustment may be different.

**Table 2: FPM for Great Britain in 2016-17 – a comparison of the income and expenditure used in our FPM calculation**

| £m | Period 6 2016-17 | | | | | Full year[6] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Budget | Actual | Variance b/(w) | Timing b/(w) | (Under)/out per-formance | Budget | Full Year Forecast | Variance b/(w) | Timing b/(w) | (Under)/out performance |
| Turnover | 769 | 763 | (6) | (4) | (2) | 1,708 | 1,693 | (15) | (1) | (14) |
| Schedule 4 | (126) | (112) | 14 | 11 | 2 | (308) | (299) | 9 | 11 | (2) |
| Schedule 8 | (14) | (59) | (45) | 0 | (45) | (104) | (180) | (76) | 0 | (76) |
| Operations | (244) | (234) | 10 | 3 | 7 | (552) | (553) | (1) | 0 | (1) |
| Support – excluding rates & industry costs | (276) | (201) | 75 | 64 | 11 | (548) | (531) | 17 | 11 | 6 |
| Maintenance | (582) | (582) | 0 | 11 | (11) | (1,258) | (1,269) | (11) | 8 | (19) |
| Capex - Renewals | (1,547) | (1,323) | 224 | 292 | (68) | (3,237) | (3,110) | 127 | 423 | (295) |
| Capex adjustment - Renewals | | | | | 51 | | | | | 222 |
| **Renewals net of Adjustments** | | | | | (17) | | | | | (74) |
| Capex - Enhancements | (1,750) | (1,650) | 100 | 149 | (49) | (3,904) | (3,958) | (54) | 69 | (123) |
| Capex adjustment - Enhancements | | | | | 37 | | | | | 92 |
| **Enhancements net of Adjustments** | | | | | (12) | | | | | (31) |
| Capex - Net Total | | | | | (29) | | | | | (105) |
| **Financial performance measure compared to Network Rail budget** | | | | | **(68)** | | | | | **(211)** |
| Less: Network Rail budget compared to PR13 | | | | | (293) | | | | | (635) |
| Less: Adjustments for missed regulatory outputs | | | | | 0 | (95) | (179) | (84) | | (179) |
| **Total financial performance measure (FPM)** | | | | | **(361)** | | | | | **(1,025)** |

[6] The financial underperformance for the control period to date (i.e. for the two and a half years to end of 2016-17) is expected to be £1,548m

# Network Rail's debt, RAB and borrowing

6.5 Network Rail's debt for Great Britain as at the end of period 6 is £41.9bn. This is £0.7bn better than budget largely due to lower capital expenditure. By the end of 2016-17, the debt is expected to be approximately in line with budget (see Table 3).

**Table 3: Net debt and borrowings for Great Britain in 2016-17**

| £m | Period 6 2016-17 | | | Full Year | | |
|---|---|---|---|---|---|---|
| | Budget | Actual | Variance b/(w) | Budget | Actual | Variance b/(w) |
| Net Debt | 42,582 | 41,897 | 685 | 45,540 | 45,476 | 64 |
| Closing RAB | 59,830 | 59,419 | (411) | 62,027 | 61,504 | (523) |
| Gearing (net debt/RAB) | 71.2% | 70.5% | 0.7% | 73.4% | 73.9% | (0.5%) |

6.6 Following the company's classification to the public sector by the Office of National Statistics (ONS), Network Rail agreed to borrow from DfT instead of issuing bonds. The amount of new borrowing available from DfT is limited to £30.9bn across CP5 for Great Britain, after this was increased by £0.7bn following the Hendy Review.

6.7 Compared to its forecast at the start of CP5, Network Rail has spent more than it expected on the renewals and enhancements work it delivered in 2014-15 and 2015-16 and is forecast to spend more on work to be delivered during 2016-17 as well. It is also planning to spend more in the remainder of CP5. This means there is pressure on its borrowing facility with DfT.

6.8 Network Rail's latest business plan for Great Britain includes financial headroom of £0.2bn, for England & Wales and £0.1bn headroom for Scotland, i.e. it thinks it will not need to use £0.3bn of the borrowing facility. This assumes that Network Rail can dispose of £1.8bn of assets to help fund the enhancement programme. The main financial risks to the headroom forecast include the costs of renewals and enhancements, delivery of efficiency initiatives, movements in interest rates and cash collateral balances, inflation and Network Rail achieving suitable strategies for generating additional cashflows through disposing of non-core assets and encouraging alternative funding arrangements.

6.9 As well as agreeing the maximum amount of borrowing across CP5 for Great Britain with DfT it also agrees an amount for each year. For 2016-17, Network Rail expects to borrow £7.7bn from DfT.

# Asset Disposals

6.10 Network Rail continues to look at the option of disposing of a number of its property related assets, with separate workstreams for freight sites, light maintenance depots and the commercial estate portfolio. Its objective is to raise a net £1.8bn to support the railway enhancement programme - in line with the Hendy report - without

compromising the safe and efficient operation of the railway. Any proposals must also satisfy the UK Government's policy and accounting requirements and deliver value for money. Network Rail has approved each workstream at the conceptual (strategic) level and is working to develop more detailed plans and outline business cases.

6.11 The company is also still considering options to sell or change the management of its 18 major stations. This would bring funding additional to the £1.8bn mentioned above. We have had a number of detailed working-level discussions with Network Rail and its advisers to explore the regulatory implications of the options, while being clear that we are not endorsing or recommending a particular approach.

6.12 Under its network licence, Network Rail will need ORR's specific consent for disposing of certain assets and we will consider the regulatory implications of all these issues as the proposals develop.

# Route level analysis of financial performance

6.13 Table 4 below is a route-level breakdown of the financial performance shown in Table 2 for all routes, i.e. it shows the total FPM of £211m by route and central units.

**Table 4: FPM - Route level cost (under)/outperformance (before allocation of central unit costs)**

| | FPM Full year income variances | | FPM Full year cost variances | | Total FPM: full year forecast |
|---|---|---|---|---|---|
| £m b/(w) | FPM variances (Turnover, schedules 4 & 8) | FPM (under)/out performance as % of actual income | FPM variances (OSM, Renewals, Enhancements) | FPM (under)/out performance as % of actual cost | |
| Anglia | (4) | (4.3%) | (5) | (0.6%) | (9) |
| LNE/EML | (9) | (2.9%) | (29) | (2.5%) | (37) |
| LNW | (1) | (0.3%) | (44) | (2.4%) | (45) |
| S. East | 2 | 1.3% | (11) | (0.9%) | (9) |
| Scotland | (1) | (0.8%) | (17) | (2.0%) | (18) |
| Wales | 1 | 2.6% | (4) | (0.8%) | (3) |
| Western | 1 | 0.7% | (7) | (0.4%) | (6) |
| Wessex | (5) | (5.0%) | (4) | (0.8%) | (8) |
| **Total** | **(16)** | **(1.2%)** | **(121)** | **(1.4%)** | **(137)** |
| Central Units[7] | (76) | (1.5%) | 2 | 0.1% | (74) |
| **Grand Total** | **(92)** | **(1.5%)** | **(119)** | **(1.2%)** | **(211)** |

[7] There was £1.5bn of expenditure in the Central Units including traction electricity costs (which are recovered through income), business rates and other industry costs as well as centrally managed capital projects such as IT, ORBIS and Plant & Machinery.

6.14 The overall underperformance of £211m is largely due to:

- central units – Schedule 8 payments reflecting delays due to various infrastructure incidents such as flooding, landslips, fires and also some asset faiures; and
- underperformance on OSM, renewals and enhancements in LNE/EML (2.5%) and LNW (2.4%) both impacted by significant underperformance on the Northern Hub project due to increases in signalling costs and increases in costs due to access issues.

# 7. The railway in Wales

## Health and safety

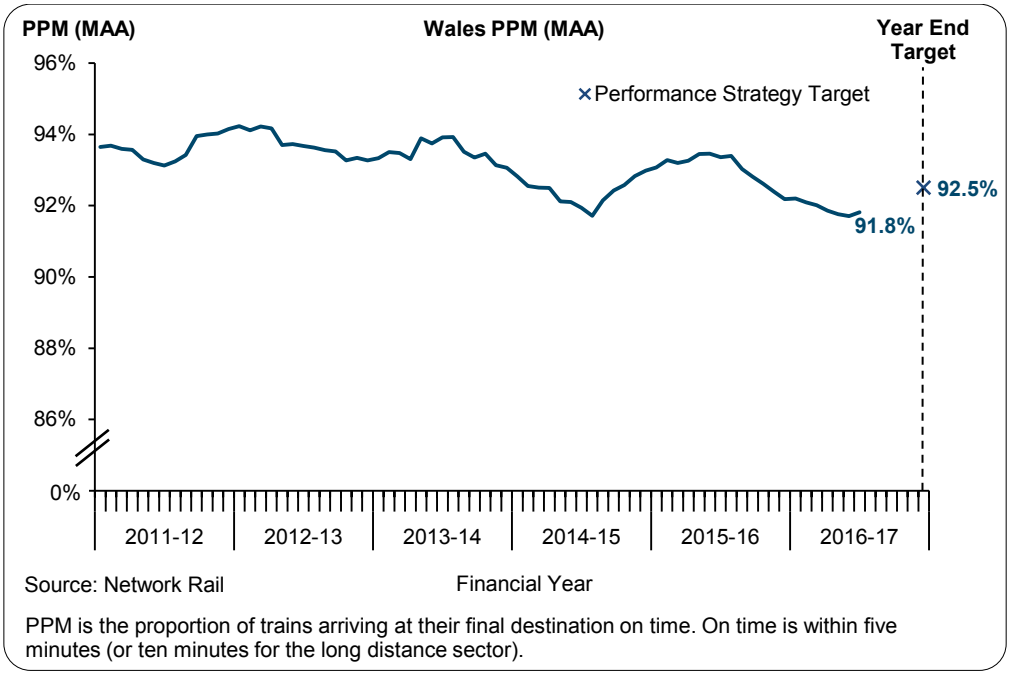
7.1 Network Rail's performance in Wales during the first half of 2016-17 was mixed measured against the company's key performance indicators. At the end of period 7 Wales Route had the lowest lost time injury frequency rate across the company but also one of the most significant shortfalls against the corporate target for close-call close out within 90 days (49% against the 80% target). In contrast to the nationally improving trend for new and repeat track twist faults, Wales Route was 29.6% worse than its CP4 exit figure. Earlier in 2016-17 the route was marginally behind its target for assessing high risk scour sites. But it recovered the position by period 7 making it the only Network Rail route to be on target for all nine elements of the train accident risk reduction programme.

7.2 Investigation of near misses caused by signaller errors between Abergavenny and Shrewsbury in the latter part of 2015-16 found a loss of focus on monitoring and supervision, and staff shortages. We have continued to explore these issues in 2016-17. We found evidence of low morale amongst staff at older manually-controlled signal boxes. This may reflect uncertainty in the light of the introduction of new technology and the move to Route Operating Centres (ROCs) which will control from one place the signalling previously carried out by the older manual boxes. We will continue to monitor progress and contribute to work being done nationally in the area of signaller competence improvement.

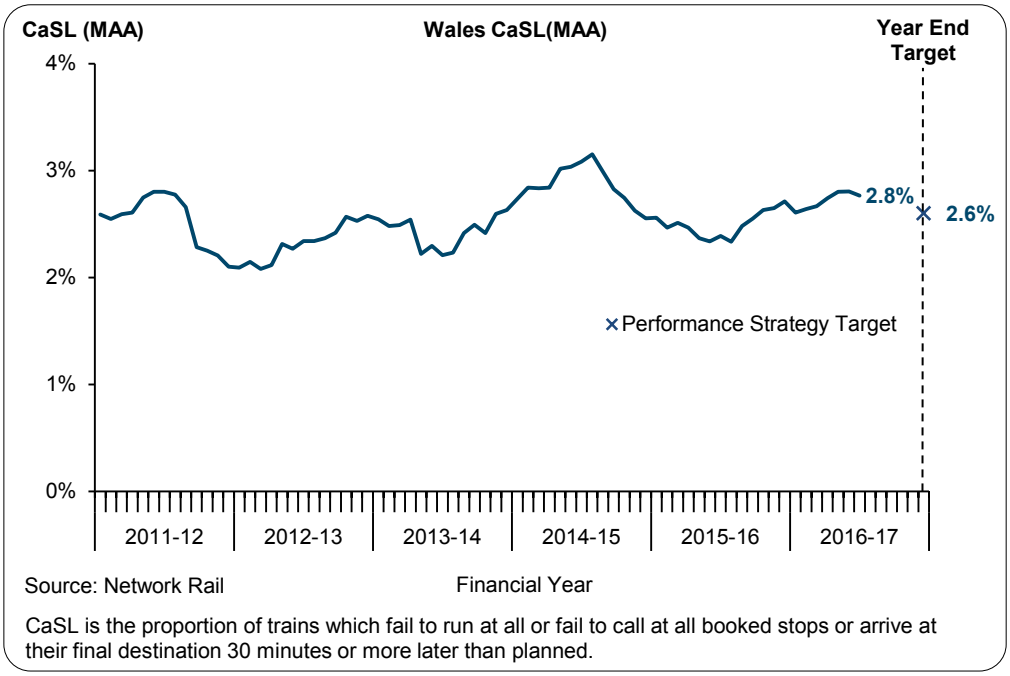
7.3 Wales Route has implemented a more robust procedure for the routine examination of ancillary structures such as signal posts, station canopies and advertising hoardings. This has dovetailed with the national efforts in this area. The route has now introduced a credible plan to restore examination compliance by the end of CP5.

## Train performance

7.4 Arriva Trains Wales' (ATW's) Public Performance Measure (PPM) Moving Annual Average (MAA) was 91.8% at the end of period 7 2016-17, 0.7pp worse than the performance strategy target. CaSL MAA was 2.8%, 0.2pp above (i.e. worse than) the performance strategy target.




PPM is the proportion of trains arriving at their final destination on time. On time is within five minutes (or ten minutes for the long distance sector).



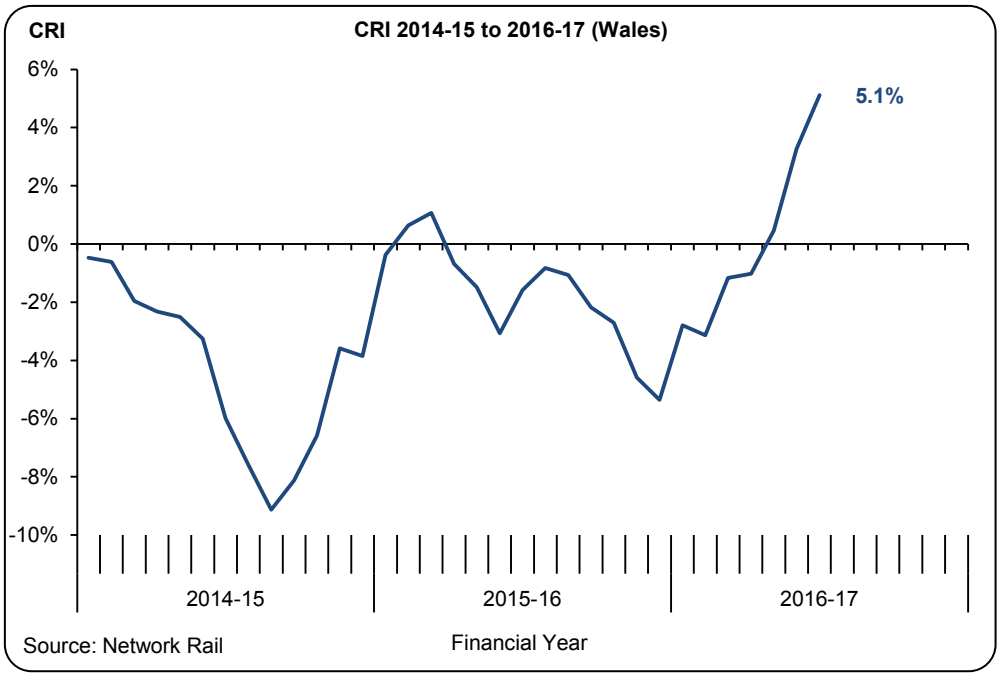

CaSL is the proportion of trains which fail to run at all or fail to call at all booked stops or arrive at their final destination 30 minutes or more later than planned.

7.5 For England and Wales, we monitor Network Rail's delivery of the PPM and CaSL targets that are agreed with the operator in the local Performance Strategies. One of the ways we do this is by using the Network Rail Scorecards, which provide route based information based on targets agreed with the operators.

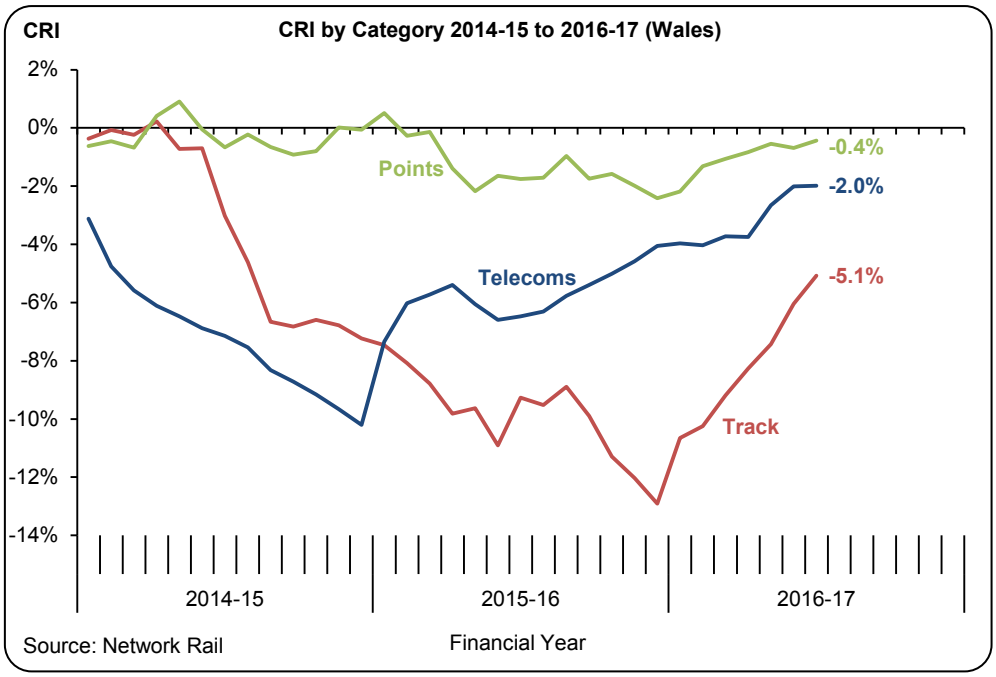
7.6 Although behind target for PPM and CaSL, performance for Arriva Trains Wales (ATW) was within the thresholds specified in the CP5 Final Determination.

# Asset management

7.7 Asset performance has improved in Wales so far this year, partially recovering the deterioration that occurred last year: CRI now stands at 5.1%, after ending last year at -5.4%.




7.8 The improvement has been driven by partial recovery in track (now contributing -5.1% to CRI, compared to -12.9% at the end of 2015-16), points (-0.4%, -2.4% at the end of 2015/16), and telecoms (-2.0%, -4.1% at end 2015/16).



# Developing the network

7.9 The work to deliver Cardiff Area Signalling Renewal is continuing to plan, despite previous delays, with major commissioning work planned for Christmas 2016. This project will enable an increase in the train service frequency to 16 trains per hour through the central core, following a previous increase to 14 trains per hour in November 2014.

7.10 Network Rail has successfully completed works at the Severn Tunnel during a six week blockade with the tunnel reopening on 22 October 2016. The scope of works included installation of over 14 km of overhead conductor rail in the 130 year old tunnel. This is a key part of the works to electrify the line between London Paddington and Cardiff, where Network Rail is planning to complete implementation and have the new electrification ready for passenger use in December 2018.

# Expenditure and financial performance

7.11 We consider Network Rail's financial performance in two different ways; firstly by providing a simple comparison of Network Rail's expenditure against its own budget and secondly by considering our regulatory performance measure.

## Expenditure

**Table 1: Income and expenditure in Wales in 2016-17 – a simple comparison of Network Rail income and expenditure.**

| | Period 6 2016-17 | | | Full year | | |
|---|---|---|---|---|---|---|
| **£m** | Budget | Actual | Variance b/(w) | Budget | Forecast | Variance b/(w) |
| Turnover | 23 | 22 | -1 | 51 | 48 | -3 |
| Schedule 4 | -8 | -4 | 4 | -24 | -21 | 3 |
| Schedule 8 | -1 | 1 | 2 | -2 | 0 | 2 |
| Operations | -13 | -12 | 1 | -30 | -31 | -1 |
| Support | -18 | -11 | 7 | -36 | -27 | 9 |
| Maintenance | -27 | -30 | -3 | -61 | -68 | -7 |
| Capex - Renewals | -92 | -78 | 14 | -222 | -204 | 18 |
| Capex - Enhancements | -83 | -71 | 12 | -207 | -199 | 8 |
| **Total** | **-219** | **-183** | **36** | **-531** | **-502** | **29** |

7.12 In the first six periods, Network Rail in Wales spent £36m less than its budget largely because of:

- £14m lower renewals expenditure. Lower volumes have been delivered than expected (the value of the renewals that have not been delivered is £18m) and this work will be delivered at a later date (see Table 2 below). Taking this into account the cost of work Network Rail has done was £4m higher than expected (adjusted to £1m in line with the 25% sharing mechanism). This is largely due to rising costs on Port Talbot resignalling and additional work planned on track renewals during the Severn Tunnel electrification blockade.

- £12m lower enhancements expenditure. This was mainly caused by lower than expected cash-funded enhancements, caused by delays on 3rd party funded level crossing work. Network Rail is expecting to catch up on this work and deliver it at the budgeted cost later in the year.

7.13 Network Rail is forecasting to spend £29m less than its budget for the full year. This is largely because of:

- £18m lower renewals expenditure. Lower volumes have been delivered than expected (the value of the renewals that are forecast not to be delivered is £35m) and this work will be delivered at a later date (see Table 2 below). Taking this into account the cost of work Network Rail will have done was £17m higher than expected (adjusted to £5m in line with the 25% sharing mechanism). This is largely due to rising costs on Port Talbot resignalling and additional work planned on track renewals during the Severn Tunnel electrification blockade.
- £9m lower support expenditure and £7m higher maintenance expenditure largely due to timing differences (see Table 2 below). Taking this into account the outperformance on support costs is forecast to be £1m and the underperformance on maintenance is £1m.
- £8m lower enhancements expenditure, largely due to an underspend on pay as you go basis schemes. These schemes are not included in the financial performance measure shown in Table 2 below.

## Regulatory financial performance

7.14 In addition to comparing against Network Rail's budget we also use our regulatory performance measure to understand Network Rail's financial performance. In regulatory financial performance we compare Network Rail's financial performance to the assumptions in our PR13 determination, adjusting for the impact of deferring or bringing forward work[8].

7.15 Network Rail's forecast for finance performance for the 2016-17 year is indicating that they will report £37m financial underperformance. This is explained in Table 2 below.

[8] See paragraph 6.3 above for a more detailed explanation.

**Table 2: FPM for Wales in Q1-2 2016-17 – a comparison of income and expenditure used in our FPM calculation**

| £m | Full year | | | | |
|---|---|---|---|---|---|
| | Budget | Full year forecast | Variance | FPM neutral incl. timing b/(w) | (Under) / out performance |
| Turnover | 51 | 48 | -3 | 0 | -3 |
| Schedule 4 | -24 | -21 | 3 | 2 | 0 |
| Schedule 8 | -2 | 0 | 2 | 0 | 2 |
| Operations | -30 | -31 | -1 | 0 | -1 |
| Support | -36 | -27 | 9 | 8 | 1 |
| Maintenance | -61 | -68 | -7 | -6 | -1 |
| Capex – Renewals | -222 | -204 | 18 | 35 | -17 |
| Capex adjustment – Renewals | | | | | 12 |
| **Renewals net of adjustments** | | | | | -5 |
| Capex – PR13 Enhancements | -207 | -199 | -8 | -8 | 0 |
| Capex adjustment – Enhancements | | | | | 0 |
| **PR13 Enhancements net of adjustments** | | | | | 0 |
| Capex – Net Total | | | | | -5 |
| **Financial performance measure compared to Network Rail budget** | | | | | -6 |
| Less: Network Rail budget compared to PR13 | | | | | -29 |
| Less: Adjustments for missed regulatory outputs | | | | | -2 |
| **Total financial performance measure (FPM)** | | | | | **-37** |

7.16 This financial underperformance is made up of a number of components, including:

- Network Rail's forecast financial performance for the full year is £6m adverse to Network Rail's own budget. This is largely because, compared to its own budget, it has forecast to underperform on track renewals arising from additional work undertaken in the Severn Tunnel and signalling underperformance arising from higher costs for work at Port Talbot;
- Network Rail's 2016-17 budget is itself £29m worse than our determination. This is due to lower planned efficiencies and higher unit costs than previously assumed across most core business activities; and
- Network Rail has estimated that we will make a £2m adjustment to financial performance for its under delivery of the PPM regulatory outputs in 2016-17. We will review this at the end of the year, so the financial adjustment may be different.

## Expenditure (excluding central unit cost allocations)

7.17 Central unit costs, such as various HQ costs and some property, are allocated to the routes. In 2015-16, these central costs of £1.5bn in Great Britain, came to approximately 16% of the total route expenditure. These include traction electricity costs (though not for Wales) which are recovered through income, business rates and other industry costs as well as centrally managed capital projects such as IT, ORBIS and plant & machinery.

7.18 Earlier tables show figures after these allocations. But to be more comparable with other routes, Table 3 looks at Wales's expenditure comparable to Network Rail's budget before the allocation of central unit costs.

**Table 3: Wales expenditure compared to budget – before allocation of central costs in Q1-2 2016-17**

| £m | Period 6 2016-17 | | | | Full year | | | |
|---|---|---|---|---|---|---|---|---|
| | Budget | Actual | Variance | Variance (%) | Budget | Forecast | Variance | Variance (%) |
| Operations | -13 | -12 | 1 | -8% | -32 | -31 | 1 | -3% |
| Support | -4 | -1 | 3 | -75% | -9 | -1 | 8 | -89% |
| Maintenance | -27 | -30 | -3 | 11% | -59 | -66 | -7 | 12% |
| Renewals | -79 | -70 | 9 | -11% | -194 | -182 | 12 | -6% |
| Enhancements | -71 | -70 | 1 | -1% | -169 | -203 | -34 | 20% |
| **Total** | **-194** | **-183** | **11** | **-6%** | **463** | **483** | **-20** | **-4%** |

# Other issues

7.19 Network Rail has worked closely with the Welsh Government and Transport for Wales on the proposals for the new Wales franchise. These include the possible transfer of parts of the valleys lines infrastructure to the franchise. It has provided data and analysis for the bidders and engaged constructively with the overall process.

# 8. Rheilffyrdd Cymru

## Iechyd a diogelwch

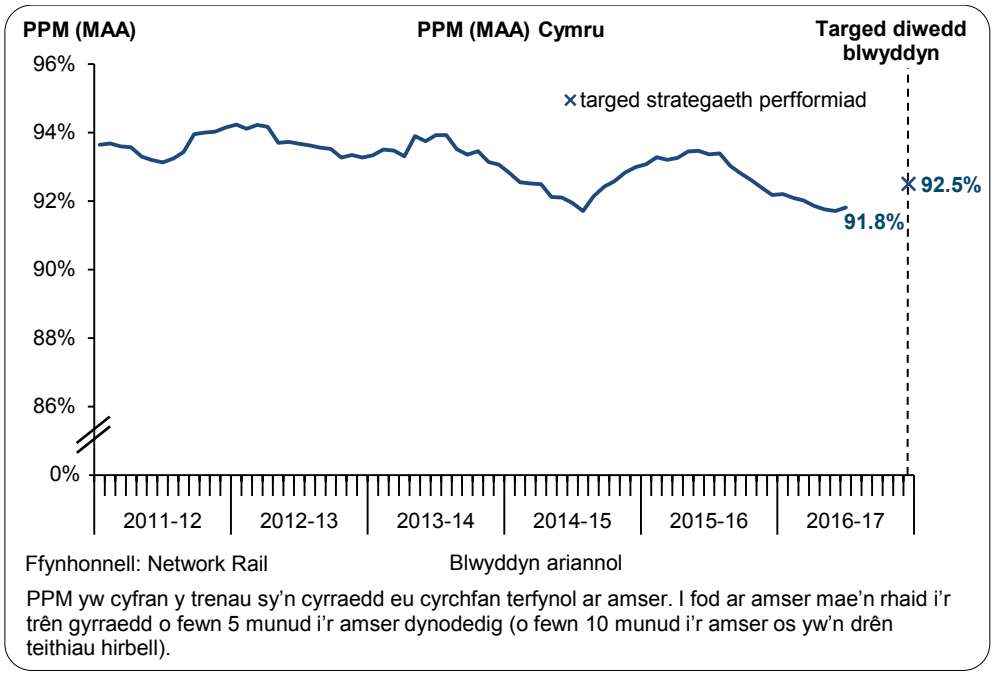
8.1 Roedd perfformiad Network Rail yng Nghymru yn ystod hanner cyntaf 2016-17 yn gymysg wrth ei fesur yn erbyn prif ddangosyddion perfformiad y cwmni. Ar ddiwedd cyfnod 7 roedd gan Rwydwaith Cymru y gyfradd amledd lleiaf ar gyfer amser anafiadau a gollwyd ar draws y cwmni, ond hefyd un o'r diffygion mwyaf sylweddol yn erbyn y targed corfforaethol i osgoi sefyllfaoedd anniogel o fewn 90 diwrnod (49% yn erbyn y targed o 80%). Mewn cyferbyniad â'r duedd genedlaethol sy'n gwella gyda namau newydd a namau sy'n ailadrodd o ran cam-linellu traciau, roedd Rhwydwaith Cymru 29.6% yn waeth na'i ffigwr ar ddiwedd Cyfnod Rheoli 4. Yn gynharach yn 2016-17 roedd y rhwydwaith ychydig y tu ôl i'w darged ar gyfer asesu safleoedd sydd â risg sgwrio uchel. Ond bu iddo adfer y sefyllfa erbyn cyfnod 7 oedd yn ei wneud yr unig un o rwydweithiau Network Rail i gyrraedd ei darged ar gyfer y 9 elfen gyfan o'r rhaglen lleihau risg o ddamweiniau trenau.

8.2 Bu i ymchwiliad i fethiannau agos wedi'u hachosi gan gamgymeriadau arwyddion rhwng Y Fenni a'r Amwythig yn rhan olaf 2015-16 ddarganfod diffyg canolbwyntio ar fonitro a goruchwylio yn ogystal â phrinder staff. Rydym ni wedi parhau i edrych ar y materion hyn yn 2016-17. Fe ddaethon ni o hyd i dystiolaeth o ysbryd isel ymysg staff oedd yn gweithio mewn hen flychau arwyddion sy'n cael eu rheoli gan bobl. Gall hyn fynegi ansicrwydd wrth ystyried cyflwyno'r dechnoleg newydd a symud at Ganolfannau Gweithredu Rhwydweithiau fydd yn rheoli'r gwaith arwyddion, oedd yn arfer cael eu rheoli gan bobl yn yr hen flychau, o un lle. Byddwn ni'n parhau i fonitro cynnydd a chyfrannu at gwblhau gwaith yn genedlaethol o ran gwella gallu arwyddwyr.

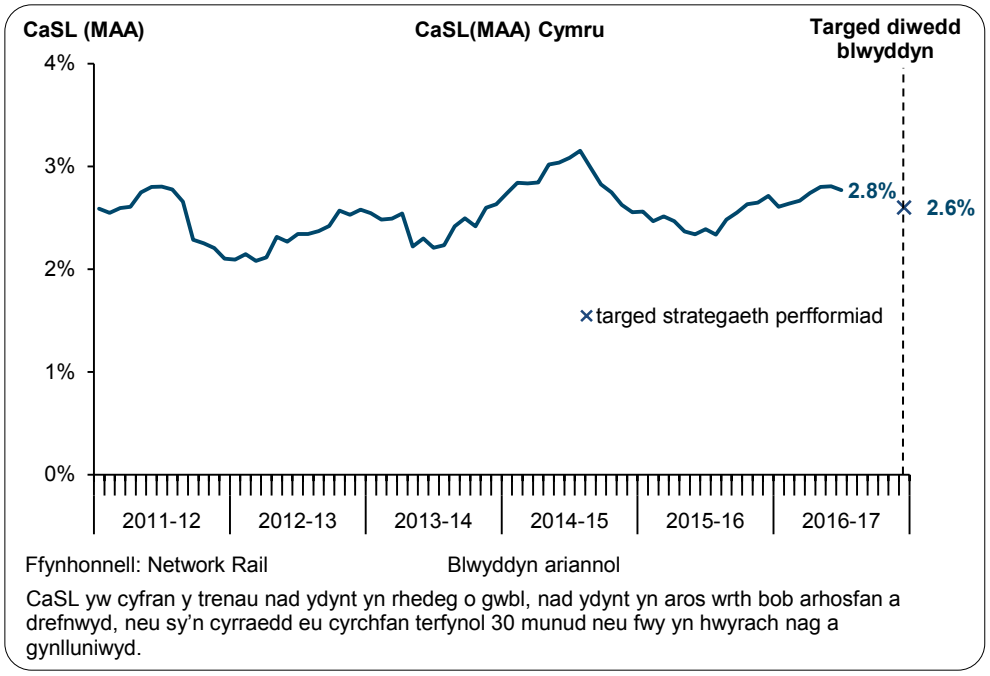
Mae Rhwydwaith Cymru wedi rhoi dull mwy cadarn ar waith ar gyfer archwiliad rheolaidd ar adeileddau ategol fel pyst arwyddion, canopïau gorsaf a hysbysfyrddau. Mae hyn wedi'u plethu ag ymdrechion cenedlaethol yn yr ardal hon. Mae'r rhwydwaith bellach wedi cyflwyno cynllun credadwy i wella gwaith cydymffurfio â'r arolwg erbyn diwedd Cyfnod Rheoli 5.

## Perfformiad trenau

8.3 Roedd Cyfartaledd Symud Blynyddol (MAA) Trenau Arriva Cymru yng nghyswllt Mesur Perfformiad Cyhoeddus (PPM) yn 91.8% ar ddiwedd cyfnod 7 y flwyddyn 2016-17, 0.7 pwynt canran yn waeth na tharged y strategaeth perfformio. Roedd y Cyfartaledd Symud Blynyddol yng nghyswllt *Trenau a Ganslwyd neu a oedd yn Arbennig o Hwyr* (CaSL) yn 0.2 pwynt canran yn uwch (hynny ydy, yn waeth) na tharged y strategaeth perfformio.




PPM yw cyfran y trenau sy'n cyrraedd eu cyrchfan terfynol ar amser. I fod ar amser mae'n rhaid i'r trên gyrraedd o fewn 5 munud i'r amser dynodedig (o fewn 10 munud i'r amser os yw'n drên teithiau hirbell).



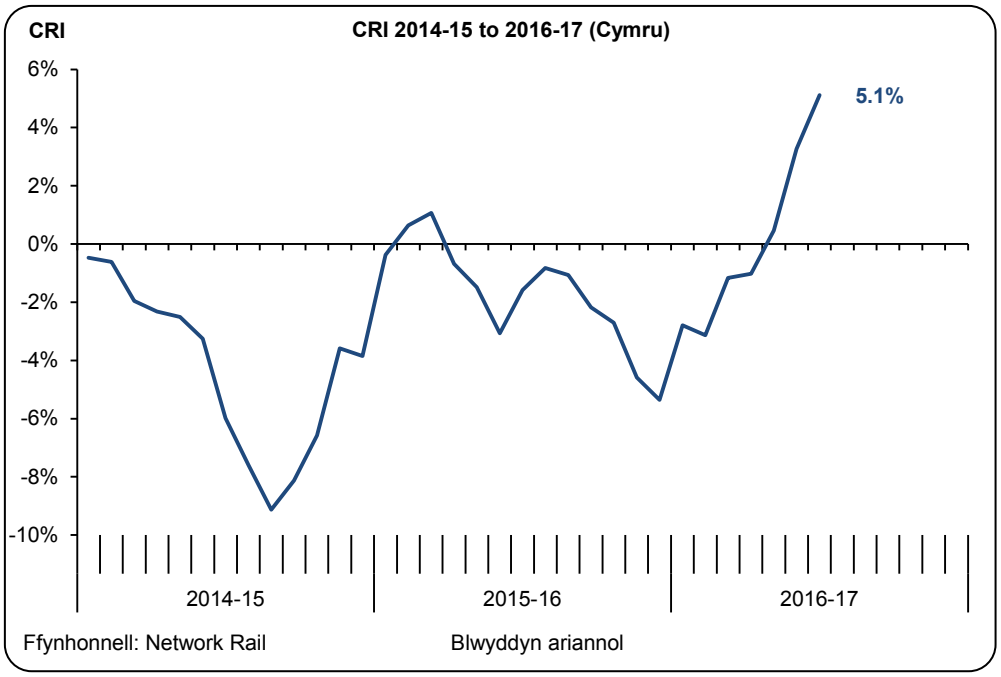

CaSL yw cyfran y trenau nad ydynt yn rhedeg o gwbl, nad ydynt yn aros wrth bob arhosfan a drefnwyd, neu sy'n cyrraedd eu cyrchfan terfynol 30 munud neu fwy yn hwyrach nag a gynlluniwyd.

8.4 Yn Lloegr ac yng Nghymru, rydym ni'n monitro'r targedau Mesur Perfformiad Cyhoeddus (PPM) a Threnau a Ganslwyd neu a oedd yn Arbennig o Hwyr (CaSL) yr ydym ni wedi cytuno arnyn nhw gyda'r gweithredwr yn y Strategaethau Perfformio lleol. Un o'r ffyrdd rydym ni'n gwneud hyn ydy defnyddio Cardiau Sgôr Network Rail, sy'n rhoi gwybodaeth am dargedau pob rhwydwaith yr ydym ni wedi cytuno arnyn nhw gyda'r gweithredwyr.

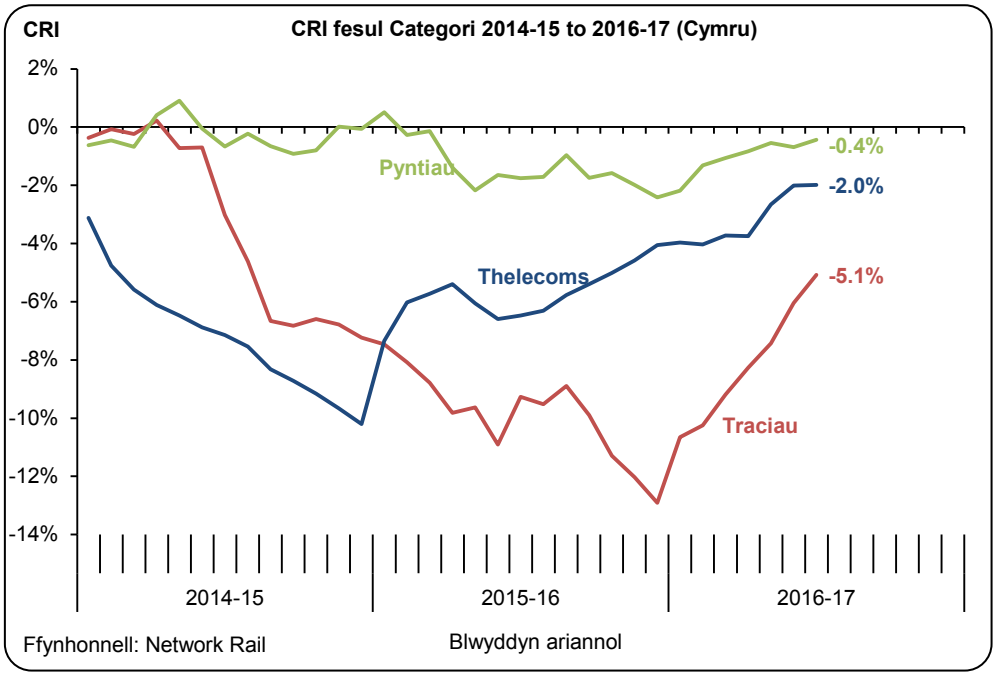
8.5 Er bod perfformiad Trenau Arriva Cymru heb gyrraedd ei dargedau Mesur Perfformiad Cyhoeddus na nifer y Trenau a Ganslwyd neu a oedd yn Arbennig o Hwyr, roedd ei berfformiad o fewn y trothwy sydd wedi'i nodi yn Nyfarniad Terfynol y Cyfnod Rheoli 5.

# Rheoli asedau

8.6 Eleni, mae perfformiad asedau wedi gwella yng Nghymru hyd yma, sy'n adfer yn rhannol dirywiad y llynedd: mae Mynegai Dibynadwyedd Cyfansawdd bellach yn 5.1%, ar ôl gorffen ar -5.4% y llynedd.




8.7 Mae'r cynnydd hwn wedi deillio o adfer rhannol y traciau (mae bellach yn cyfrannu -5.1% at y Mynegai Dibynadwyedd Cyfansawdd, o'i gymharu â -12.9% ar ddiwedd y flwyddyn 2015-16), pwyntiau (-0.4%, -2.4% ar ddiwedd y flwyddyn 2015-16), a thelecoms (-2.0%, -4.1% ar ddiwedd y flwyddyn 2015-16).



# Datblygu'r rhwydwaith

8.8 Mae'r gwaith wedi parhau er mwyn rhoi'r cynllun Adnewyddu Arwyddion Ardal Caerdydd ar waith, er gwaethaf gwaith oedi blaenorol, gyda llawer iawn o waith comisiynu wedi'i drefnu yn ystod gwyliau'r Nadolig 2016. Bydd y prosiect hwn yn caniatáu cynyddu amledd y gwasanaethau trên i 16 trên yr awr trwy'r craidd canolog, yn dilyn cynnydd blaenorol i 14 trên yr awr ym mis Tachwedd 2014.

8.9 Mae Network Rail wedi llwyddo i gwblhau gwaith yn Nhwnnel Hafren yn ystod gwarchae chwe wythnos gyda'r twnnel yn ailagor ar yr 22 Hydref, 2016. Roedd y gwaith yn cynnwys gosod dros 14km o reiliau dargludo yn y twnnel sy'n 130 oed. Mae hwn yn rhan allweddol o'r gwaith i drydaneiddio'r rhwydwaith rhwng gorsaf Paddington yn Llundain a Chaerdydd. Mae Network Rail yn bwriadu cwblhau'r gwaith a bod y trydaniad newydd yn barod i deithwyr ei ddefnyddio erbyn mis Rhagfyr 2018.

# Gwariant a pherfformiad ariannol

8.10 Rydym ni'n ystyried perfformiad ariannol Network Rail mewn dwy ffordd wahanol; yn gyntaf trwy ddarparu cymhariaeth syml o wariant Network Rail yn erbyn ei gyllideb ei hun ac yn ail, trwy ystyried ein mesur perfformiad rheoleiddiol.

## Gwariant

**Tabl 1: Incwm a gwariant yng Nghymru yn 2016-17 - cymhariaeth syml o incwm a gwariant Network Rail.**

| | Blwyddyn i'r dyddiad | | | Rhagolwg blwyddyn gyfan | | |
|---|---|---|---|---|---|---|
| **£m** | Cyllideb | Gwirione-ddol | Amrywiaeth gwell/(gwaeth) | Cyllideb | Rhagolwg | Amrywiaeth gwell/(gwaeth) |
| Trosiant | 23 | 22 | -1 | 51 | 48 | -3 |
| Cynllun atodol 4 | -8 | -4 | 4 | -24 | -21 | 3 |
| Cynllun atodol 8 | -1 | 1 | 2 | -2 | 0 | 2 |
| Gweithredu | -13 | -12 | 1 | -30 | -31 | -1 |
| Cefnogi | -18 | -11 | 7 | -36 | -27 | 9 |
| Cynnal a chadw | -27 | -30 | -3 | -61 | -68 | -7 |
| Capex - Adnewyddu | -92 | -78 | 14 | -222 | -204 | 18 |
| Capex - Gwelliannau | -83 | -71 | 12 | -207 | -199 | 8 |
| **Cyfanswm** | **-219** | **-183** | **36** | **-531** | **-502** | **29** |

8.11 Yn y chwe chyfnod cyntaf, bu i Network Rail yng Nghymru wario £36m yn llai na'i gyllideb i raddau helaeth oherwydd:

- £41m yn llai o gostau adnewyddu. Gwnaed llai o waith na'r disgwyl (ni wnaed gwerth £18m o waith adnewyddu) ac fe gaiff y gwaith hwn ei wneud yn ddiweddarach (edrychwch ar Dabl 2 isod). O ystyried hyn, roedd cost y gwaith y bu i Network Rail ei wneud £4m yn fwy na'r disgwyl (wedi'i addasu i £1m yn unol â'r 25% o fecanwaith rhannu). Mae hyn i raddau helaeth oherwydd y costau cynyddol yn ymwneud â'r gwaith ailarwyddo ym Mhort Talbot a gwaith

ychwanegol wedi'i gynllunio ar adnewyddu traciau yn ystod gwarchae gwaith trydaneiddio Twnnel Hafren.

- £12m yn llai o gostau gwelliannau. Roedd hyn yn bennaf oherwydd llai o welliannau na'r disgwyl o gronfeydd arian parod, wedi'u hachosi gan oedi ar waith croesfan wastad wedi'i ariannu gan 3ydd parti. Mae Network Rail yn disgwyl dal i fyny gyda'r gwaith hwn a'i wneud am y gost sydd wedi'i gyllidebu hwyrach ymlaen yn y flwyddyn.

8.12 Mae Network Rail yn rhagweld y bydd yn gwario £29m yn llai na'r gyllideb ar gyfer y flwyddyn gyfan. Mae hyn yn bennaf oherwydd:

- £18m yn llai o gostau adnewyddu. Gwnaed llai o waith na'r disgwyl (oherwydd ddilieu gwerth £35m o waith adnewyddu) ac fe gaiff y gwaith hwn ei wneud yn ddiweddarach (edrychwch ar Dabl 2 isod). O ystyried hyn, bydd cost y gwaith y mae Network Rail wedi ei wneud £17m yn fwy na'r disgwyl (wedi'i addasu i £5m yn unol â'r 25% o fecanwaith rhannu). Mae hyn i raddau helaeth oherwydd y costau cynyddol yn ymwneud â'r gwaith ailarwyddo ym Mhort Talbot a gwaith ychwanegol wedi'i gynllunio ar adnewyddu traciau yn ystod gwarchae gwaith trydaneiddio Twnnel Hafren.
- £9m yn llai o wariant cefnogi a £7m yn fwy o wariant cynnal a chadw yn bennaf oherwydd gwahaniaeth amseru (edrychwch ar Dabl 2 isod). O ystyried hyn, mae'n debyg y bydd y gorberfformiad gyda chostau cefnogi yn £1m a'r tangyflawni ar waith cynnal a chadw yn £1m.

8.13 £8m yn llai o wariant gwelliannau, yn bennaf oherwydd tanwariant ar gynlluniau sy'n gweithredu ar sail talu wrth fynd. Dydy'r cynlluniau hyn ddim wedi'u cynnwys yn y mesur perfformiad ariannol sydd wedi'i ddangos isod yn Nhabl 2.

## Perfformiad ariannol rheoleiddiol

8.14 Yn ychwanegol at gymharu yn erbyn cyllideb Network Rail rydym ni hefyd yn defnyddio ein mesur perfformiad rheoleiddiol er mwyn deall perfformiad ariannol Network Rail. Yn y perfformiad ariannol rheoleiddiol rydym ni'n cymharu perfformiad ariannol Network Rail gyda'r rhagdybiau yn ein dyfarniad PR13, ac yn ei addasu ar gyfer unrhyw effaith o ohirio gwaith neu symud gwaith yn ei flaen[9].

8.15 Mae rhagolwg Network Rail ar gyfer perfformiad ariannol y flwyddyn 2016-17 yn dangos y bydd yn adrodd gwerth £37m o dangyflawni ariannol. Mae hyn wedi'i egluro yn Nhabl 2 isod.

[9] Edrychwch ar baragraff 6.3 uchod am eglurhad mwy manwl.

**Tabl 2: Mesur Perfformiad Ariannol (MPA) yn Ch1-2 2016-17 - cymharu incwm a gwariant wedi'u defnyddio yn ein cyfrifiad Mesur Perfformiad Ariannol.**

| £m | Rhagolwg blwyddyn gyfan 2016-17 | | | | |
|---|---|---|---|---|---|
| | Cyllideb | Rhagolwg blwyddyn gyfan | Amrywi-aeth | MPA niwtral yn cynnwys amseru gwell/(gwaeth) | (Tan) / gor berfformiad |
| Trosiant | 51 | 48 | -3 | 0 | -3 |
| Cynllun atodol 4 | -24 | -21 | 3 | 2 | 0 |
| Cynllun atodol 8 | -2 | 0 | 2 | 0 | 2 |
| Gweithredu | -30 | -31 | -1 | 0 | -1 |
| Cefnogaeth | -36 | -27 | 9 | 8 | 1 |
| Cynnal a chadw | -61 | -68 | -7 | -6 | -1 |
| Capex - Adnewyddu | -222 | -204 | 18 | 35 | -17 |
| Addasiadau Capex - Adnewyddu | | | | | 12 |
| **Gwaith adnewyddu net unrhyw addasiad** | | | | | -5 |
| Capex - PR13 Gwelliannau | -207 | -199 | -8 | -8 | 0 |
| Addasiadau Capex - Gwelliannau | | | | | 0 |
| **Gwelliannau PR13 net yr Addasiadau** | | | | | 0 |
| Capex - Cyfanswm Net | | | | | -5 |
| **Mesur perfformiad ariannol o'i gymharu â chyllideb Network Rail** | | | | | -6 |
| Llai: Cyllideb Network Rail o'i gymharu â PR13 | | | | | -29 |
| Llai: Addasiadau oherwydd gwaith rheoleiddiol wedi ei golli | | | | | -2 |
| **Cyfanswm y mesur perfformiad ariannol (MPA)** | | | | | **-37** |

8.16 Mae'r tangyflawni ariannol hwn yn cynnwys sawl elfen, gan gynnwys:

- Mae rhagolwg perfformiad ariannol Network Rail ar gyfer y flwyddyn gyfan £6m yn groes i gyllideb Network Rail. Mae hyn yn bennaf oherwydd, o'i gymharu â'i gyllideb ei hun, mae wedi rhagweld y bydd yn tangyflawni gyda gwaith adnewyddu traciau sy'n codi o waith ychwanegol gyda Thwnnel Hafren ac yn nodi tangyflawniad sy'n codi o gostau uwch ar gyfer y gwaith ym Mhort Talbot;
- Mae cyllideb Network Rail ar gyfer y flwyddyn 2016-17 £29m yn waeth na'n dyfarniad. Mae hyn oherwydd effeithlonrwydd is a chostau unedau uwch na'r hyn oedd eisoes wedi'u tybio gyda'r rhan fwyaf o weithgareddau busnes craidd; ac
- Mae Network Rail wedi amcan y byddwn ni'n addasu £2m ar gyfer y perfformiad ariannol oherwydd ei dangyflawniad gyda gwaith rheoleiddio Mesur Perfformiad Cyhoeddus yn y flwyddyn 2016-17. Byddwn ni'n adolygu hyn ar ddiwedd y flwyddyn, felly efallai bydd yr addasiad ariannol ychydig yn wahanol.

## Gwariant (ac eithrio dyrannu costau unedau canolog )

8.17 Caiff costau unedau canolog, fel costau pencadlys amrywiol a pheth costau eiddo, eu clustnodi i'r rheilffyrdd. Yn 2015-16, roedd y costau canolog hyn o £1.5bn ym Mhrydain oddeutu 16% o gyfanswm gwariant cyfan rhwydwaith. Mae'r rhain yn cynnwys costau tyniant trydan (ond nid yng Nghymru) a geir yn ôl drwy incwm, trethi busnes a chostau diwydiannol eraill ynghyd â chostau cyfalaf sy'n cael eu rheoli'n ganolog fel Technoleg Gwybodaeth, ORBIS a Pheiriannau a Chyfarpar.

8.18 Mae tablau cynharach yn dangos y ffigyrau ar ôl y dyraniadau hyn. Ond i allu cymharu'n well gyda rheilffyrdd eraill mae Tabl 3 yn edrych ar wariant Cymru o'i gymharu â chyllideb Network Rail cyn dynodi'r costau unedau canolog.

**Tabl 3: Gwariant Cymru o'i gymharu â'r gyllideb - cyn dyrannu costau unedau canolog yn Ch1-2 2016-17**

| £m | Blwyddyn i'r dyddiad | | | | Rhagolwg blwyddyn gyfan | | | |
|---|---|---|---|---|---|---|---|---|
| | Cyllideb | Gwirion-eddol | Amrywi-aeth | Amrywiaeth (%) | Cyllideb | Rhagolwg | Amrywi-aeth | Amrywiaeth (%) |
| Gweithredu | -13 | -12 | 1 | -8% | -32 | -31 | 1 | -3% |
| Cefnogi | -4 | -1 | 3 | -75% | -9 | -1 | 8 | -89% |
| Cynnal a chadw | -27 | -30 | -3 | 11% | -59 | -66 | -7 | 12% |
| Adnewyddu | -79 | -70 | 9 | -11% | -194 | -182 | 12 | -6% |
| Gwelliannau | -71 | -70 | 1 | -1% | -169 | -203 | -34 | 20% |
| **Cyfanswm** | **-194** | **-183** | **11** | **-6%** | **463** | **483** | **-20** | **-4%** |

# Materion eraill

8.19 Mae Network Rail wedi gweithio'n agos gyda Llywodraeth Cymru a Chludiant yng Nghymru ar y cynigion ar gyfer y fasnachfraint newydd i Gymru. Mae hyn yn cynnwys gwaith posibl o drosglwyddo rhannau o isadeileddau rhwydweithiau'r Cymoedd i'r fasnachfraint.  Mae wedi darparu data a dadansoddiad i'r cynigwyr ac wedi cymryd rhan adeiladol yn y proses ar y cyfan.

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