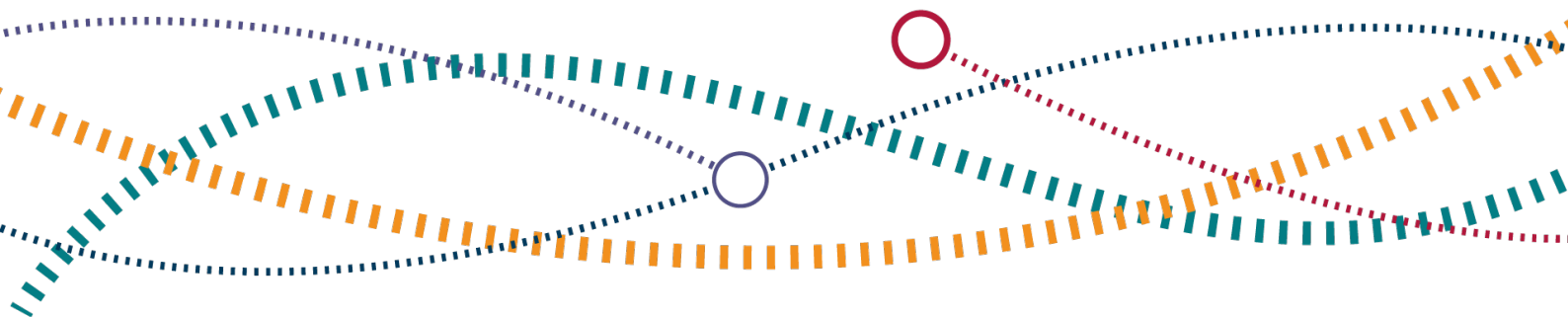




Operational Property deferred renewal & workbank change control management

Targeted Assurance Review

28 July 2021



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Glossary & Definitions

Term	Definition
ALE	The asset life expectancy (ALE) is defined in the Network Rail asset policy according to the type of asset and its average usage.
ARL	Asset Remaining Life (ARL) is obtained based on the physical inspection of an Operational Property asset.
ARS	Average risk score (ARS) is a score for impact on safety and performance in the event of failure. The score is calculated based on surveyor's inputs ¹ into Operational Property Asset System (OPAS), following asset's annual inspection or detailed examination.
CEFA	Civil Examination Framework Agreement (CEFA).
CP	A control period (CP) is the period to which an access charges review (e.g. a periodic review) applies. Control periods are typically five years in length, but maybe shorter or longer depending on what the regulator decides as part of the review.
CP6	Control Period 6 (CP6) is from year 2019 to 2024.
CRAM	Corporate Risk Assessment Matrix (CRAM) is a matrix which is referred in Network Rail Standard NR/L2/HAM/02001 to carry out risk assessment on four impact areas namely Safety / Health / Environment, Performance, Finance, Satisfaction & Reputation.
CRI	Composite Reliability Index (CRI), also known as Building Reliability Index (BRI) in the Operational Property portfolio. CRI is measured by the total number of reactive faults requiring urgent intervention.
CSI	Composite Sustainability Index.

¹ Factors are defined in Network Rail Standard NR/L2/CIV/006/03G.

Term	Definition
DEAM	Director of Engineering and Asset Management.
DUs	Delivery units (DUs) are Network Rail's maintenance teams based in geographic locations across its network.
OP	Operational Property (OP) is an asset portfolio comprised of five key building management models which are Stations (Managed Stations & Franchised Stations), Light Maintenance Depots, Maintenance Delivery Units, Route Services (Supply Chain Operation) and Lineside Buildings.
OPAS	Operational Property Asset System (OPAS) is a database where inventory and condition information on Operational Property assets are held.
OPIs	Operational Property Inspections.
ORR	Office of Rail and Road.
PARL	The percentage of asset remaining life (PARL) is calculated by dividing the asset remaining life (ARL) by the asset life expectancy (ALE). Asset life expectancy is defined in Network Rail asset policy according to the type of asset and its average usage. PARL is used as measure of asset condition in Operational Property portfolio.
PPF	Putting Passengers First (PPF) is a programme announced by Network Rail in June 2019. The programme aims to support Network Rail's ambition to have the skills, culture and focus to put passengers and freight users at the core of everything it does.
PR23	The 2023 periodic review of Network Rail (relating to CP7).
ORR	Office of Rail and Road.
PARL	The percentage of asset remaining life (PARL) is calculated by dividing the asset remaining life (ARL) by the asset life expectancy (ALE). Asset life expectancy is defined in Network Rail asset policy according to the

Term	Definition
	type of asset and its average usage. PARL is used as measure of asset condition in Operational Property portfolio.
PPF	Putting Passengers First (PPF) is a programme announced by Network Rail in June 2019. The programme aims to support Network Rail's ambition to have the skills, culture and focus to put passengers and freight users at the core of everything it does.
PR23	The 2023 periodic review of Network Rail (relating to CP7).
RAM	Region/ Route Asset Manager.
Region	Network Rail's five operating regions – Eastern, North West and Central, Scotland, Southern and Wales & Western.
RFI	Request for Information.
RPP	Railway Planning and Performance.
SFO	Station Facility Operator.
TA	Technical Authority (TA) is a central business unit within Network Rail that, among others things, sets technical policies and standards for the routes, the SO and the wider rail industry.
TAR	Targeted Assurance Review.
TOCs	Train operating companies (TOCs) run the (passenger and freight) trains and services on the network. The representative body for the passenger operating companies is the Association of Train Operating Companies (ATOC).

Executive Summary

Review Objective

During review of CP6 Year 1 renewal delivery, we were aware of the extent of deferral and re-prioritisation of renewals in the Operational Property portfolio. Network Rail has a defined process to manage risks arising from deferred renewals and reports quarterly on its renewal deliverability in each financial year. However, we found that reporting does not provide visibility on how regions justify their decisions on deferrals and how impact on performance outputs such as safety & performance, cost, volumes, efficiency and asset sustainability are assessed and reported as part of a change control process.

For this reason, we undertook this Target Assurance Review to seek assurance on the ability of each region to manage risks arising from deferred renewals in the Operational Property asset portfolio, and to gain detailed information about regional processes used to manage workbank changes and impacts to performance outputs.

Key Findings

- All regions broadly managed risks arising from deferred renewals in Operational Property in line with Network Rail's defined process. However, we identified that there were varied approaches to undertaking risk assessment across regions and lack of detailed justifications for some deferred schemes on the Wessex route.
- Change control processes adopted in Eastern, Southern and Wales & Western regions have been evolving following the "Putting Passengers First" Programme. The processes in Scotland and Wales & Western region are found to be less developed than other regions, which has resulted in a lack of visibility on how impact on cost, volumes and efficiency against baseline targets were assessed and monitored coherently with workbank changes.
- Regions have been shown to exhibit a strong focus on assessing safety and performance risks. However, a tool that can provide insight on expected changes in asset conditions alongside the influence of minor works that could extend actual asset life is lacking. Hence, regions find it difficult to assess risk of deteriorating conditions quantitatively for deferred renewals.
- Good practice and areas for improvement identified in this review are summarised as below.

Good Practice	Areas for Improvement
<ul style="list-style-type: none"> • Eastern region considered predicated mitigation cost incurred as part of its decision making process for deferrals; it performed trend analysis to understand the historical impacts of deferrals. • North West & Central region demonstrated use of a dashboard and change control process system to link its business plan with risk assessment outcomes. • South East and Wessex in Southern region demonstrated clear processes used before PPF to manage workbank changes with appropriate channels and a supporting system. 	<ul style="list-style-type: none"> • Regions' risk assessments for deferrals did not clearly record which metric was driving the most severe risks. • Scotland lacked evidence of how delivery of efficiency is tracked and monitored against targets. • Wessex in Southern region provided limited justifications for some deferred renewals in its register. • Western in Wales & Western region did not use the latest version of the Corporate Risk Assessment Matrix (CRAM) to evaluate risks.

Recommendations

This review makes three recommendations (listed below). We intend to monitor Network Rail's progress and actions to address these recommendations over the following 6 months.

Recommendation 1: Review and update deferred renewal registers

- Each region to undertake a review and update, if required, of its routes' deferred renewal registers with risk scores recorded for each impact area under CRAM.
- Wessex in Southern region to improve clarity of justification details for deferrals.
- Western in Wales & Western region to ensure correct version of CRAM is used for risk assessment.

Recommendation 2: Establish consistent change control process

Eastern region to consider adopting a consistent approach between routes to manage Operational Property renewal workbanks.

Recommendation 3: Understand impact on sustainability of asset conditions at portfolio level

Regions would benefit from guidance on how the impact on sustainability of asset conditions at portfolio level can be evaluated. It was understood that the Technical Authority has been working on a degradation model development programme for Operational Property, which is expected to be released in early 2022, in order to help regions understand influence of workbank changes and varied intervention activities on maintaining asset conditions.

1. Introduction

1.1 Purpose

The purpose of this Targeted Assurance Review (TAR) is:

- to give ORR assurance on the ability of each Network Rail region to manage risks arising from deferred renewals in the Operational Property asset portfolio with Corporate Risk Assessment Matrix² (CRAM), in line with Network Rail's Standard NR/L2/HAM/02001³; and
- to understand how changes in the workbank of Operational Property and impacts to performance outputs are managed and controlled by regions.

1.2 Background

During review of CP6 Year 1 renewal delivery in the Operational Property portfolio, some regions needed to re-prioritise and defer their renewal works in Year 1 to future years.

Network Rail confirmed that the deferral of renewal delivery had been managed according to a defined deferral process. However, we have limited visibility on how regions manage their workbank changes, or how impacts on performance outputs such as cost, volumes efficiency are assessed and reported as part of a change control process.

To gain assurance that impact of workbank changes on performance outputs are reasonably assessed and monitored, we wanted to understand Network Rail's change control processes for the Operational Property renewal workbank implemented within each region. This understanding being considered beneficial to inform our review of regions' annual performance and to prepare for the 2023 periodic review (PR23).

1.3 Scope

This TAR covers:

- deferral renewal changes made in franchised or managed stations; and

² 'Corporate Risk Assessment Matrix, version 3.0, March 2019'

³ 'Management of risk arising from deferred renewals, issue 5'

- route's or region's change control process adopted to manage renewal schemes that have been deferred, cancelled or swapped, and associated impacts on the following performance outputs.
 - Safety and performance;
 - Cost, volumes and efficiency; and
 - Asset sustainability

This review targets the Operational Property asset management teams of eight routes across five regions.

2. Assurance Approach

This assurance review was undertaken through the following engagement activities with Network Rail:

- We provided written notification of the TAR to the Network Technical Head of Operation Property in the Technical Authority and to the eight Route Asset Managers (RAMs) / Engineers in five regions;
- Phase 1 Request for Information (RFI) – the following routes (or regions) were selected to provide responses to our questions on the processes and tools used to assess impact of workbank changes on performance outputs.
 - Eastern: the North East route and the Anglia route;
 - North West & Central;
 - Scotland;
 - Southern: the South East route and the Wessex route; and
 - Wales & Western: the Wales route and the Western route.
- Following our review of the RFI response, the following five routes (or regions) were chosen for Phase 2 interview.
 - Eastern: the Anglia route;
 - North West & Central;
 - Scotland;
 - Southern: the Wessex route; and
 - Wales & Western: the Western route.
- In Phase 2 Interviews, the routes (or regions) were required to demonstrate the use of processes and tools with examples.
- The final phase required qualitative analysis of information obtained from the above.

3. Findings

The findings in this section have been collated from our engagement with the RAM teams through the RFI and interviews. The full list of questions included in the Phase 1 RFI can be found from Appendix A. Regions' responses are summarised in Appendix B.

Key findings are presented in three subsections covering the following topics.

- Management of risks arising from deferral renewals
- Change control process for workbank changes
- Impact assessment on performance outputs

3.1 Management of Risks arising from Deferred Renewals

All eight routes engaged in this review demonstrated that they are generally following Network Rail standard NR/L2/HAM/02001 to assess risk arising from deferral renewals using the Corporate Risk Assessment Matrix (CRAM). Deferred renewal registers provided contain details of deferred schemes, CRAM scores, agreed mitigations and progress against the delivery mitigation, as required by the standard.

During our review we identified the following examples of what we would consider good practice:

- The Anglia and North East routes in Eastern performed trend analysis to understand historical impacts of deferral on achieving regulatory outputs for continuous improvement in planning workbank and CRAM assessments.
- North West & Central demonstrated a clear link between risk assessments for deferrals and its change control process system to support decision making.

This review however did highlight some variations in how risk assessments on impact areas were performed by the routes using CRAM scores and recorded in the deferred renewals registers.

- Anglia, Scotland, South East and Wessex only recorded the highest severity and likelihood scores. Anglia and Scotland did not identify which metric (i.e. Safety, Performance, Finance, or Satisfaction & Reputation) under CRAM

was driving the most severe risk. North West & Central recorded the total CRAM scores of impact areas assessed, which therefore cannot provide granular details of the risk assessment of each impact area.

- Anglia was in the process of developing a weighted system with an "aggregate risk score" in order to facilitate better prioritisation. We recommend Anglia seek advice from Technical Authority on the proposed weighting measure.
- A number of descriptions of the justification for deferrals in Wessex's register lacked specific details.
- Western did not use the latest version of CRAM (March 2019) from which criteria "Asset Management" was removed; impact should be assessed through asset reliability and asset sustainability.

3.2 Change Control Process for Workbank Changes

All regions were able to explain their change control processes for managing renewal workbanks. However, Wales & Western (W&W) was not able to provide a documented change control process.

This review identified that there were inconsistencies in change control processes adopted by routes within the same region. At the time of engagement, except North West & Central and Scotland, other regions were in the process of aligning their routes' processes for a consistent regional planning and change control approach. It was noted that some routes' change control processes provided for this TAR were adopted before the PPF programme implementation and are under review by regions as part of the ongoing alignment exercises.

A number of routes have change control panels as part of their change control processes. These panels are comprised of senior members such as Regional Engineer, Head of Engineering and Asset Manager (HEAM), Director of Route Asset Management or Financial Controller. Application of triggers to escalate changes for panel's authorisation varied depending on regions' internal governance requirements.

Table 3.1 summaries change control process adopted by routes engaged in this TAR. Where there is not currently a change control panel or established trigger for escalation (such as Anglia and Scotland), decision making was found to rest with the relevant asset management team.

Table 3.1 Change Control Process Summary

Region	Routes	Documented process	Management system/ tool	Change Control Panel	Trigger for Escalation
Eastern	Anglia	Yes	Route bespoke system	No	No
Eastern	North East	Yes	Change Control Log	Yes	Cost Trigger
NW&C	All Routes	Yes	Route bespoke system	Yes	No
Scotland	Scotland	Yes	Change Control Log	Yes (note 1)	No
Southern	South East	Yes	Route bespoke system	Yes	Cost Trigger
Southern	Wessex	Yes	Change Control Log	Yes	Cost Trigger
W&W	Wales	No	Change Control Log	No (note 2)	Cost Trigger after PPF
W&W	Western	No	Change Control Log	No (note 2)	Cost Trigger after PPF

Note 1: Scotland uses Civil, Structures and Buildings Corporate Governance meeting held periodically as Change Control Panel which is attended by Asset Teams, the HEAM, Programme Managers of Works Delivery and Capital Delivery, and is chaired by Regional Finance.

Note 2: Change control panel attended by HEAM and financial controller after PPF

We identified the following examples of what we would consider good practice:

- All routes in North West & Central consistently managed workbank changes including deferrals with its asset workbank system called "Integrated management System" (IMS). Recording of justifications was managed by the established change proposal and approval process within the system. CRAM assessments for deferrals were clearly linked to its change control process in IMS.
- Wessex in the Southern region demonstrated a clear change review process, including justifications by waterfall diagram and approval procedures, through appropriate channels.

Some routes have applied bespoke digital systems to manage their workbank changes, which are considered good practice or a positive step to track and manage their workbank in a coherent way. However, limitations or inconsistency in some systems or tools were identified.

- Although a workbank management system is in place in Anglia, the guidance provided does not indicate justifications for workbank changes such as CRAM assessment as mandatory input. We also noticed in our recent review on Network Rail Year 2020-21 Reforecast (RF11) that there was reporting error in renewal volumes in Eastern due to review process of investment paper. This indicates that there is opportunity for the region to reinforce its review process and management system to link its business plan with risk decisions.
- Scotland managed changes to the plan by its change control log and other meetings such as periodic governance meetings according to its "Guidance on managing Live Plans". It was noted that the guidance was established in 2014 for CP5 and that some contents described do not reflect changes in organisational structure implemented for the PPF programme. For example, Infrastructure Projects (IP) structure had been replaced by a new Capital Delivery Directorate. It was suggested that the region needs to review its guidance to reflect any changes in process or roles. Scotland responded that there is a proposal to bring in a Lead Asset Strategy and Business Planning Manager who will help shape the Business Planning and ultimately the change control process.
- Escalation approach to workbank changes adopted by the Wales route and the Western route are considered to be consistent. However, their systems or tools were not aligned. Western maintained a log for cancelled schemes, but corresponding risk assessments were not recorded. It is therefore not possible to identify if justifications were made for cancellations in its change control process which was not provided for this review. It was noted that Wales & Western was going through an alignment exercise of change control process at the time of interview.

3.3 Impact Assessment on Performance Outputs

This section includes key findings of how impacts of workbank changes, including deferrals, on the performance outputs listed below were assessed and monitored by regions.

- Safety and performance
- Cost, volumes and efficiency
- Asset sustainability

Safety and Performance

Network Rail defines two metrics, Percentage Asset Remaining Life (PARL) and Average Risk Score (ARS), for Operational Property assets. ARS is a score for impact on safety and performance in the event of failure (note: probability and condition are not taken into account in score). Asset condition is expressed as asset remaining life (ARL). Both ARS and ARL are based on annual visual examinations and detailed examinations undertaken every five years by surveyors. ARL is then converted to PARL in Operational Property Asset System (OPAS), where inventory and condition information is held, using the asset life expectancy.

$$\text{PARL} = (\text{ARL} / \text{Asset Life Expectancy}) \times 100$$

With reference to CP6 Operational Property Asset Policy, determination of timing and type of interventions for given assets relate to measures of individual assets PARL (condition) and its ARS (impact on safety and performance). ARS and PARL thresholds are defined to dictate the application of a specific intervention regime.

The asset policy states that "safety, risk and performance remain core to Network Rail Operational Property intervention policy". We found that all regions showed continual alignment to the asset policy. Regions consistently applied PARL and ARS, alongside other Operational Property asset information, to support their assessments of impact on safety and performance. It was suggested that recording these specific Operational Property metrics as part of justifications would assist future review of deferred schemes.

Good practice of assessing impacts on safety and performance was observed in this review.

- North West & Central demonstrated by an example that it reviewed performance trend of asset with its analytical tool "Building Dashboard" based on historical faults recorded in OPAS to support its assessment.

Cost, Volumes and Efficiency

The routes engaged in this TAR provided evidence on how cost and volume are tracked against baseline with a change control system or log.

Eastern, North West & Central and Southern showed how impact on cost, volume and delivery efficiency in future years were regularly reviewed as part of their change control process. Examples in these regions are listed below.

- Anglia quantified and captured review of impact on cost and volume on future years by a periodic impact analysis report. Anglia and North East routes evidenced consideration of predicted mitigation costs incurred as part of their decision making process, which did not appear in other regions.
- North West & Central monitored impact on cost, volume and delivery efficiency through its "Integrated Management System" and used a periodic Finance Report as means of assurance.
- The South East route monitored cost and volume with its "Capex Renewals Management App" against baseline targets and reviewed at 4-weekly period Business Reviews. Wessex applied waterfall diagrams to facilitate its understanding and review of changes. Southern recognised the need to move from a reactive to proactive approach in order to improve efficiency. The region is also in process of upskilling its in-house Works Delivery (WD) team in order to achieve better delivery efficiency.

While Scotland stated that an efficiency target was set at portfolio level, it is unclear how it is tracked and monitored over time. Other regions confirmed that impact on delivery efficiency was monitored and reviewed through project efficiency trackers, as well as exploitation of opportunities to improve delivery efficiency of projects. The delivery efficiency was commonly claimed from:

- planning of works taking account of improved packaging; and
- closer working relationship with TOCs or other funders.

Some regions stated that focus was primarily put on improving delivery efficiency of projects (i.e. capital efficiency) in order to achieve a given unit rate.

For Wales & Western, there was no clear evidence illustrating how impacts on cost, volumes and efficiency against baseline targets were reviewed and monitored over time as part of its change control process due to unavailable documentation provided in this TAR.

Asset Sustainability

Across the network, there was no evidence that tools or relevant metrics were used by regions to understand the impact on sustainability as part of the risk management process for deferred renewals. Regions lack confidence on how impacts on sustainability can be evaluated. Some regions responded that they did not identify sustainability as a factor to be considered when making changes to workbanks during the control period.

We were told that the Composite Sustainability Index (CSI), which is used to measure asset sustainability at portfolio level, is not sensitive enough to reflect the impact of an individual scheme on sustainability at portfolio level. Hence, regions rarely referred to CSI during the control period but referred to the index when preparing their workbanks for the next control period.

Some regions recognised the needs to consider the impact of planned and delivered renewals from a sustainability perspective. However, there is not an available analytical tool that can provide insight of expected changes in asset conditions alongside the influence of minor works such as reactive repairs that could extend actual asset life. Hence, regions find it difficult to assess the risk of deteriorating conditions quantitatively. We are aware that Technical Authority has been working on a deterioration modelling for Operational Property, which is expected to be released in early 2022, in order to help regions understand the influence of workbank changes and varied intervention activities on maintaining asset conditions.

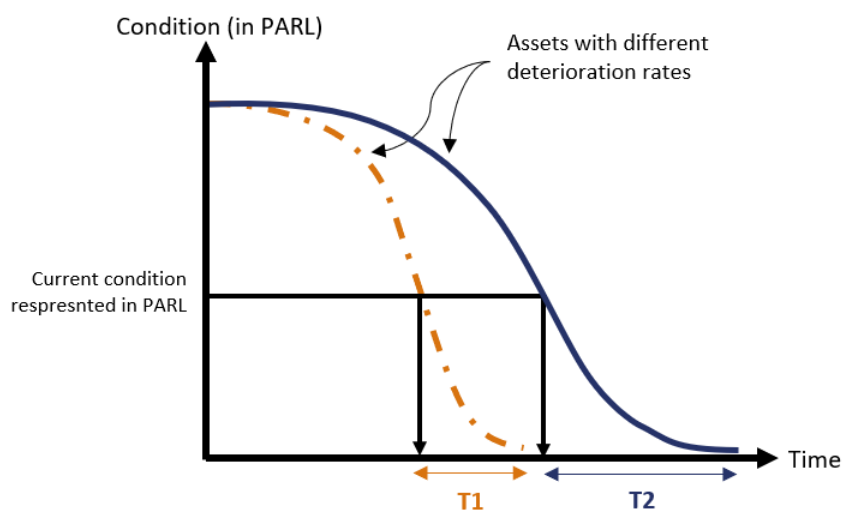
- Southern recognised that particular critical assets like footbridges and platforms deteriorate quicker than other assets and are of high risk. Hence, South East and Wessex have renewed a considerable number of footbridges with condition issues.

4. Observations

4.1 Asset Deteriorations

Deferring renewals continually will lead to overall decline in asset condition over time and greater reliance on management intervention. As shown in Figure 4.1, assets of the same condition (in PARL) with different deterioration rates, which depends on individual asset features, local conditions and intervention histories, can represent different points in the asset life cycle.

Figure 4.1 Deterioration curves



Where renewal schemes are deferred, regular and frequent minor interventions may be required to maintain condition of the asset and slow down the deterioration rate. It was noted that regions monitored asset conditions during deferred period through enhanced (i.e. more frequent) Operational Property Inspections (OPIs), undertook mitigation repairs and understood causes of degradation. Consistent responses indicate that there was no specific condition target at which the asset needs to be sustained during deferred period.

A particular region mentioned that central degradation model and decision supporting tool were used to give an indication where in the lifecycle the asset is. However, there was not enough detailed information in the response about how the region applied the model and tool.

It was suggested that understanding of the deterioration rate would be one of the key inputs to gain insight into whether the rate of deterioration will outpace the rate of asset renewals.

4.2 Asset Data System

We noted from the interview that there were comments from some regions on asset data quality and the functionality of Operational Property Asset System (OPAS). These include:

- difficulties in extracting asset data from OPAS; and
- erroneous asset data such as the condition score recorded by inspectors in OPAS.

Southern stated that asset condition scores were occasionally recorded with errors by inspectors. For example, a low condition score in PARL was given for a renewed asset. This may consequently affect the top down model used for business planning. To address data errors in OPAS, the region has taken appropriate actions to perform sampling check of data from bottom up as part of their quality assurance review and audit, and applied their local asset knowledge to gain understanding where information is missing or inaccurate. Southern was also conscious of the needs to enhance competency of inspectors from supply chain to accurately evaluate and record asset conditions in order to improve asset data quality.

During the interview, we understand that regions had provided feedback on functionality of OPAS to Technical Authority (TA) who is working on the "Operational Property Workstream" replacing OPAS. Network Rail's project initiation document says that the replacement system involves digitalisation of survey process with development of mobile applications and standardised platform in order to deliver benefits such as better communication of condition information, and improvement in monitoring compliance and informing investment decisions. TA also highlighted that regions as owners of asset data are expected to define and implement action plans to address asset data quality issues.

4.3 Engaging with Stakeholders

Based on the interviews, it was considered that regions liaise regularly with their external stakeholders, and communicate their work plans through structured meetings, appropriate channels and documents such as Integrated Station Plans (ISPs). Most regions demonstrated clear understanding of main drivers that would affect internal and external stakeholders and assessed associated impact as part of their risk management processes.

Regions stated that maintaining close engagement with stakeholders such as train operating companies (TOCs), station facility operators (SFOs) and external funders would benefit regions with local asset knowledge and exploits opportunities to coordinate schemes to achieve better delivery efficiency.

5. Conclusions

Management of Risks arising from Deferred Renewals

It was concluded that all regions broadly managed risks arising from deferred renewals in Operational Property, in line with the Network Rail Standard. In addition to criteria defined in CRAM, regions considered other asset metrics and information to justify their assessments.

However, we found that there were varied approaches to how risk assessments were performed using CRAM scores and a lack of detailed justifications for some deferred schemes. Some regions also used an out-of-date CRAM. Thus, there is a need for regions to review and update their registers to improve granularity and clarity for both assurance and monitoring purposes.

Change Control Process

All regions were able to explain their change control processes used to manage their workbanks before the PPF programme although Wales & Western was not able to provide a documented process. This review identified that decision making authority rested with the asset management team in some regions. Opportunities exist to:

- consider escalation plans as part of change control process in order to manage situations that require increased awareness and swift action from senior level; and
- improve justifications for cancelled schemes, accelerated schemes and deferrals within the change control process and deferred renewal register.

It was concluded that change control processes, including system or tools, used in most of the regions have been evolving following the PPF programme. The majority of regions are cognisant of strengths and limitations of individual routes' processes and are progressing towards integrating their workbank planning and change control processes. We noted that routes' processes in Eastern may not be merged into a regional process. However, it was important that ownership and local empowerment of workbank planning would benefit from a consistent decision-making approach and dissemination of good practices within a region.

Impact assessment on performance outputs

Regions demonstrated continual alignment to the CP6 Operational Property Asset Policy that "safety, risk and performance remain core to Network Rail Operational Property

intervention policy". Therefore, regions exhibited a strong focus on safety and performance risks in their impact assessments.

This review found that Scotland and Wales & Western regions' impact assessments on cost, volume and efficiency are less developed than others. Impacts to cost and volumes were tracked and monitored against baselines consistently through the change control process and tools in most regions, but maturity to monitor impact on efficiency needs to be improved. It was also noted that regions are putting their focus primarily on improving delivery efficiency of projects (i.e. capital efficiency).

Some regions recognised the need to consider the impact of planned and delivered renewals from a sustainability perspective, but associated impact was not assessed. There appeared to be a lack of understanding and confidence in how impact on sustainability can be evaluated. It was concluded that there was no evidence of assessment of the impact on sustainability in the change control process during the control period. However, we are aware that the Technical Authority has been working on a degradation model development programme for Operational Property, which is expected to be released in early 2022, in order to help regions understand influence of varied interventions activities on maintaining asset conditions.

Observations

Regions monitored asset conditions during the deferred period through enhanced Operational Property Inspections. There were a number of comments from some regions on asset data quality and functionality of OPAS. Thus some regions applied local asset knowledge when needed. We are aware that regions had provided their feedback on OPAS functionality to the Technical Authority (TA) who is working on a programme to replace OPAS with a new asset system. As part of our regulatory activities, ongoing engagement with the TA is undertaken in order to understand the support which the proposed new asset data system could provide to improve functionality of current OPAS for better accessibility of asset data. However, regions as owners of asset data are expected to maintain a robust governance process to ensure the accuracy and completeness of asset data.

Regions engaged a variety of stakeholders to communicate their work plans and changes with regular structured meetings and appropriate platforms. Most regions demonstrated clear understanding of the potential impact of changes on their stakeholders and assessed accordingly as part of their risk management process.

6. Recommendations

This review makes three recommendations. We intend to monitor Network Rail's progress and actions to address these recommendations over the following 6 months.

Recommendation 1

The intent of the following recommendation is to ensure that risk decisions can be monitored and tracked over time with appropriate levels of clarity and information.

Review and update deferred renewal registers

- a) Each region to undertake a review and update, if required, of its routes' deferred renewal registers with risk scores recorded for each impact area under CRAM.
- b) Wessex in Southern region to improve clarity of justification details for deferrals.
- c) Western in Wales & Western region to ensure correct version of CRAM is used for risk assessment.

Owner: Regional DEAM

Timescale: by CP6 Year 3 Q3

Recommendation 2

The intent of the following recommendation is to obtain a better monitoring and evaluation approach for guiding decision making.

Establish consistent change control process

Eastern region to consider adopting a consistent approach between routes to manage Operational Property renewal workbanks.

Owner: Regional DEAM

Timescale: by CP6 Year 3 Q3

Recommendation 3

The intent of the following recommendation is to gain insight into impact of interventions on asset conditions, and to enable a forecast on long-term sustainability of asset conditions.

Understand impact on sustainability of asset conditions at portfolio level

Regions would benefit from guidance on how the impact on sustainability of asset conditions at portfolio level can be evaluated. It was understood that the Technical Authority has been working on a degradation model development programme for Operational Property, which is expected to be released in early 2022, in order to help regions understand influence of workbank changes and varied intervention activities on maintaining asset conditions.

Owner: Network Technical Head of Operational Property, Technical Authority

Timescale: early 2022

Appendices

Appendix A - RFI Questions

In Phase 1 of this review, we require the identified routes to provide a short written statement outlining their routine work processes which they adopt to manage changes to their renewal workbank. The responses should cover the following:

Impact assessments

- What processes does the route use to quantify what impact the change of workbank has on performance outputs (cost, volume, safety, efficiency, sustainability and performance)?
- What tool(s) is used to assess the impact of change?

Change control processes

- What processes and information does the route use to justify and inform the needs of workbank changes?
- Is there any stakeholder outside Network Rail to be engaged for changes identified?
- Who need to review / approve the changes?
- How is the change documented?
- What other systems/documents have to be updated upon request of changes and following changes?

Benefit realisation / lessons learned

- What processes are used to measure and monitor the resulting impact of changes? For example, quantitative data on outputs; or qualitative reviews of how effective the decision-making process is?
- How are 'lessons learned' fed back into the process?

Appendix B – Summary of Regions' Responses

Eastern

<p>Management of Risks arising from Deferred Renewals</p>	<p>Both Anglia and North East routes provided their deferred renewal registers which contain details of deferred renewals, assessment of risks using CRAM scores, agreed mitigations and progress against the delivery of mitigations, as required in standard NR/L2/HAM/02001. Justifications for deferred renewals were recorded in form a short summary of reasons in the register.</p> <p>There are variations between two routes in how risk assessment on impact areas were performed using CRAM scoring and recorded in their registers. The North East route recorded severity and likelihood scores for each impact area, while Anglia only recorded the highest severity and likelihood scores. Therefore it is not clear which metric was driving the most severe risk. Anglia was cognisant of the needs to update its register and presented a working version of updated register in the interview, to address traceability and transparency of risk assessments. It was noted that Anglia was in the process of developing a weighted system with an "aggregate risk score" in order to facilitate better prioritisation.</p> <p>Both Anglia and North East routes performed trend analysis to understand historical impacts of deferral on achieving regulatory outputs to improve future planning of workbank and CRAM assessment.</p>
<p>Robustness of Change Control Process</p>	<p>Both Anglia and North East routes managed changes to workbank with their own change control processes, alongside Network Rail deferred renewal standard NR/L2/HAM/02001. Since changes control processes are bespoke to routes, there are at least two change control processes used within Eastern region. It was noted that both Anglia and North East routes' change control processes are used by all asset disciplines (i.e. not Operational Property's specific).</p> <p>There were inconsistencies in approval processes of workbank changes within Eastern region. Both East Midland and North East routes applied "panel approach" triggered by anticipated final cost (AFC) while Anglia applied "correspondence approach" which was not triggered by any metric. It was noted that decision making authority to approve workbank changes rested within the asset management team in Anglia.</p> <p>Anglia applied CRAM scores to assess impact of workbank changes. Although a routine workbank management system is in place in Anglia, the system is used by all asset disciplines and primarily focuses on impact to cost and volume. Justifications such as</p>

	<p>CRAM scores and deferral histories are part of the input to the system. However, they are not mandatory. It was noted that change control process in Eastern remains route-based after devolution in order to align with ownership of access and budget.</p>
<p>Impact Assessment on performance outputs</p>	<p>Safety & Performance: Anglia and North East routes described that CRAM score was used as supporting tool to assess impacts quantitatively for deferred renewals. To support its risk assessment, Anglia used other data sources such as CEFA surveys, defect reports, structural assessments, and local knowledge from TOCs and delivery units for asset condition and load carrying capability. <i>[Example: Highbury and Islington Station Deck Replacement]</i></p> <p>Cost & Volume: Anglia and North East routes recorded predicted mitigation costs incurred from deferrals in the registers, which did not appear in other regions or routes. <i>[Example: Highbury and Islington Station Deck Replacement]</i> Anglia considered predicated mitigation costs as part of decision-making process for deferrals. Anglia quantified impact of workbank changes on cost and volume by a periodic impact analysis report which was derived from the change control process. Therefore, sources of the report seem trackable.</p> <p>Efficiency: North East route confirmed that they monitor Headwinds Efficiencies, Tailwinds and Inefficiencies (HETI). Anglia acknowledged that other routes in Eastern are monitoring HETI. Anglia started assessing impact to efficiency after PPF with projects' efficiency trackers and uses periodic meeting as an on-going basis to improve its understanding and monitoring over impact on efficiency outputs. In addition to batching works through improved planning, Anglia also considered opportunities within the industry to the scheme such as third party funding from adjacent developers and integrating improvement strategy with TfL in order to achieve better efficiency. <i>[Example: Highbury and Islington Station Deck Replacement]</i></p> <p>Sustainability: Both Anglia and North East routes responded that there was no tool currently available to assess impact of deferral on sustainability. Anglia said that consideration is given to the scope of deferrals to understand whether future work scope can be refined to extend the life of an asset with whole life cost consideration. The renewals community are currently considering how the impact of deferrals on sustainability can be measured more effectively. Anglia stated that composite sustainability index (CSI) is not widely used due to lack of confidence in CSI.</p>

North West Central

<p>Management of Risks arising from Deferred Renewals</p>	<p>NW&C region managed risks arising from deferred renewals by assessing impacts with CRAM scores, and recording mitigations and corresponding delivery progress, as required by standard NR/L2/HAM/02001. This can be evidenced from region's deferred renewal register provided. NW&C region only recorded one CRAM score, with associated scores for severity and likelihood, in its register. NW&C explained that it assessed all impact areas under CRAM and the score in register represented the total CRAM scores of assessed impact areas. The region responded that improvement will be made to the register to provide granular details of CRAM score of each impact area for monitoring</p> <p>The region also recorded cancellation of renewal schemes in its deferred register and each entry in the register links with reference to its change control process.</p>
<p>Robustness of Change Control Process</p>	<p>All routes across NW&C region managed workbank changes including deferrals consistently with its asset workbank system called "Integrated management System" (IMS) alongside Network Rail deferred renewal standard NR/L2/HAM/02001. The system is supported by periodic regional and route's change control meetings, and regional change control panel reviewing changes impacting current financial year.</p> <p>The region applied same principle as CRAM to assess impact qualitatively (i.e. without CRAM scores) for changes to workbank such as cancellation or acceleration. With reference to the evidence of IMS processes provided by the region, recording of justifications associated with changes were properly managed and controlled by the established change proposal and approval process within IMS. The change control reference linking deferral renewal register and IMS provided evidence that changes request, risk assessment and mitigations could be tracked and monitored through the system.</p>
<p>Impact Assessment on performance outputs</p>	<p>Safety & Performance: NW&C quantified impact due to deferral by CRAM score and responded that same principle as CRAM was applied to assess qualitatively impact of other workbank changes such as cancellation, accelerations and swaps. The region walked through an example and presented how its Power BI system "Building dashboard" was applied to analyse asset data such as asset remaining life (ARL), percentage asset remaining life (PARL), Station Stewardship Measure (SMM) and historical faults reported exported from OPAS. <i>[Example: Rochdale Station Lift Renewal]</i></p> <p>Cost, Volume & Efficiency: The region assessed and reviewed impact on cost, volume and efficiency through its workbank management system (i.e. IMS). The variance between Oracle Projects and Business plan were monitored by periodic Finance</p>

	<p>Report. Although RAM responded that cost of mitigation incurred by deferral was considered for life cycle cost, there was no documented assessment to evidence its consideration. Opportunities for delivery efficiencies were considered through developing scope of works with third parties such as TOCs or delivering renewals under third parties' projects.</p> <p>Sustainability: NW&C responded in the RFI phase that impact on sustainability was considered but not documented. Therefore, there was no evidence of assessment available. The region said that safety, risk and performance remain core to operation property intervention policy. RAM expressed that it was difficult to quantify impact of deferral or workbank changes on asset conditions, and commented that the Composite Sustainability Index (CSI) of Operational Property is not dynamic and sensitive to indicate impact on sustainability at asset portfolio level due to changes to individual schemes.</p>
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Scotland

<p>Management of Risks arising from Deferred Renewals</p>	<p>Scotland relied heavily on the criteria factors in CRAM to assess risks arising from deferred renewal. The region's deferred renewal register contained details of deferred renewals, assessment of risk with CRAM scores, agreed mitigations and associated progress of delivery, as required in standard NR/L2/HAM/02001. The region only recorded the highest severity and likelihood scores in its assessment. Although the region explained all the impact areas were assessed, it is not clear from the register which metric was driving the most severe risk. Scotland presented by a deferred renewal scheme <i>[Example: Auchinleck Station Platform Renewal]</i> for which action plan of repairs was prepared if longer deferral is required. The region concluded that the platform with poor condition deemed safe without immediate repairs based on engineering judgement.</p>
<p>Robustness of Change Control Process</p>	<p>Scotland managed recoding of justifications of changes to the plan by its change control log. The region outlined a number of change control and governance meetings held periodically. There was however no documentation which succinctly describes the change control process, roles and responsibilities of those parties involved in the decision-making process for workbank changes.</p> <p>Scotland linked CRAM assessments of deferrals to the change control log with change control reference in its deferral renewal register. Although the region responded that CRAM was used to assess risks for accelerated schemes, there was no evidence available for the risk assessment and how changes were managed and controlled through its change control process (log). It was stated that Scotland will appoint a lead asset strategy and business planning manager to oversee the workbank management process across all disciplines. It was suggested that Scotland should establish a road map for developing documented change control process to manage workbank changes.</p>
<p>Impact Assessment on performance outputs</p>	<p>Safety & Performance: In addition to the use of CRAM criteria associated with performance and safety, Scotland assessed performance and safety risk by other metrics such as PARL and ASR, and local asset knowledge.</p> <p>Cost, Volume & Efficiency: Although variances in cost and volume due to changes to individual scheme were recorded in the change control log provided, there was no evidence to demonstrate use of analysis or tools to understand, review and track the change impact to cost and volumes against baseline over time, as part of change control and authority processes. It was described by the region that efficiency strategy is overseen by regional Head of Engineering and Asset Management (HEAM) and efficiency target was set for whole Operational Property asset portfolio rather than individual projects. Where there is impact to efficiency,</p>

	<p>RAM reported to the change control meeting and investment authority panel. However, there was no evidence to demonstrate how the efficiency was tracked and monitored as part of the change control process.</p> <p>Sustainability: Scotland adopted the CRAM to assess risk. However, it does not identify sustainability as a factor to be considered. The region said it monitored the condition and deteriorations of individual assets through enhanced Operational Property Inspections (OPIs) where works were deferred. However, there was no evidence showing how the impact on sustainability was considered and reviewed.</p>
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Southern

<p>Management of Risks arising from Deferred Renewals</p>	<p>Southern used CRAM to manage risks in their deferred renewals registers by assessing primary impacts such as Safety, Performance, Finance and Reputation. Wessex's deferred renewal register showed that mitigations and corresponding delivery progress were recorded, as required by standard NR/L2/HAM/02001.</p> <p>It was noted that a number of descriptions of the justification in Wessex's register for deferral lacked specific details. It was also found that only the highest CRAM score (i.e. summation of impact and likelihood scores) for the identified impact area driver was recorded in Wessex's register. Wessex clarified that all impact areas were considered first to identify the driver for assessment. Similar occurred in South East route's deferred renewal register, in which impact area assessed was not identified although scores of impacts and likelihood were recorded separately.</p>
<p>Robustness of Change Control Process</p>	<p>There were two change control processes used within Southern. Impact of workbank changes in the South East route was managed through its route-based system called "Capex Renewals Management App" (CAPP), and assessed by RAM team and change control panel alongside Network Rail deferred renewal standard NR/L2/HAM/02001 for deferral renewals.</p> <p>Wessex demonstrated a more comprehensive and clear change process including communications and approvals through appropriate channels, depending on approval thresholds. This was evidenced by the "Wessex Change Process Flowchart" provided. The route communicated and reviewed confirmed changes made to workbank at its periodic change panel meeting with waterfall diagrams summarising movement in costs, change logs, and risks and opportunities logs. However, transforming agreed changes into the live workbank was not clearly illustrated.</p> <p>Both routes defined cost threshold for escalating change proposals to Periodic Change Control Panel for authorisation.</p> <p>Southern highlighted that Wessex's process was under review and its workbank will be transformed into the South East route's format. Routes' workbank will then be consolidated to form an integrated plan.</p>
<p>Impact Assessment on performance outputs</p>	<p>Safety and performance: Southern assessed impact by using asset related safety incidents monitored through Network Rail Standard NR/L2/CIV/028 process and tracking asset reliability (i.e. Composite Reliability Indicator measure) monthly, in addition to</p>

PARL and ARS metrics. RAM expressed that CRI may not be an ideal indicator but it can highlight reliability issues based on faults reported by local station managers.

Cost & Volume: The South East route monitored and reviewed cost and volume against baseline targets at 4-weekly period Business Reviews, while Wessex used waterfall diagrams tracking the type and magnitude of changes made to facilitate its understanding and review of changes in its change control panel. Wessex considered impact of life cycle cost when making decision on deferrals, but there was no formal assessment undertaken.

Efficiency: Efficiency target was set for each project in Southern. Efficiencies were recorded and monitored through delivery organisations' trackers with an established template for measuring HETI. Impact of workbank changes on efficiency was assessed by measuring cost of combined schemes against the original Strategic Business plan budgets. Southern told that it is in the process of upskilling its Works Delivery (WD) team to deliver less complex schemes in order to achieve better efficiency.

Sustainability: Southern tracked asset sustainability through Composite Sustainability Measure (CSI) measure. The region commented that CSI, which is used to measure asset sustainability at portfolio level, is not sensitive as an indicator to monitor impact of changes made to individual scheme. The region recognised that particular critical assets like footbridges and platforms deteriorate quicker than other assets and are of high risks. Hence, both routes have renewed a considerable number of footbridges with condition issues.

Whilst the region described the use of Operational Property Inspections (OPIs) data to understand asset deteriorations, there was no tool used to measure and monitor how the assets deteriorate over time. As such the region was not able to evidence the assessment of impact on sustainability in its process.

Wales & Western

<p>Management of Risks arising from Deferred Renewals</p>	<p>Whilst Western responded that impact on finance was considered, there was no evidence of the assessment of impact in its register. Western's risk assessment was undertaken based on the out-of-date CRAM with asset management impact as one single area.</p>
<p>Robustness of Change Control Process</p>	<p>Although change review processes adopted by both routes in Wales & Western before devolution were considered to be consistent according to their RFI responses, their change control systems or tools were not aligned. Both routes were not able to provide a documented change control process. The region was going through alignment exercise at the time of interview and in the process of moving to one regional change control process with cost trigger for escalating approval of changes to Head of Engineering and Asset Management (HEAM).</p> <p>Western maintained a log in its deferred renewal register for cancelled schemes, which were told to be assessed by the same process as deferrals, but associated risk assessment was not found in the register. Due to unavailable change control process, it was not able to establish the link between justifications or risk assessments for cancelled schemes and its change control process.</p>
<p>Impact Assessment on performance outputs</p>	<p>Safety and Performance: Wales and Western used composite reliability index (CRI) according to CRAM to asset impact on safety and performance in addition to other data such as local knowledge of asset, route criticality, historical faults, structural assessment data, and asset conditions from Operational Property Inspections (OPIs).</p> <p>Cost, Volumes and Efficiency: Impacts were managed through change control system or logs. Changes to cost and delivery efficiency were managed through investment panel and process with financial performance metric (FPM) alongside regional and project efficiency trackers. However, there lacked documented process to illustrate how assessments of impact were considered and embedded into its change control process. RAM described that delivery efficiency was claimed through improved planning to pack and deliver works together.</p> <p>Sustainability: Wales and Western did not identify sustainability as a factor to be considered, thus there was no evidence of the assessment of the impact on sustainability. The region described that high level degradation models in asset policy and decision supporting tool on asset degradation were applied to give indication of what point the asset deteriorates at. The result was used as one of the sources to inform CRAM assessment of impact on safety and performance but not sustainability.</p>



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