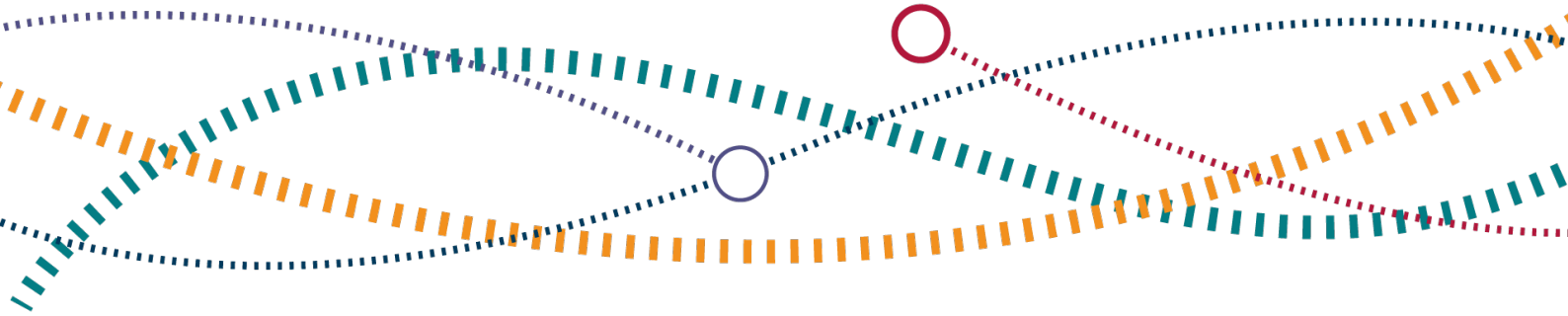
Network Rail's approach to Maintenance

Targeted Assurance Review

16 August 2022



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1. Introduction

1.1 Background

1.1 This Targeted Assurance Review (TAR) is part of a continuing ORR assurance activity to understand and inform the Office of Rail and Road (ORR) of Network Rail's (NR) current state and developing approaches to maintenance. This project will:

(a) Inform ORR's understanding of current NR practices, for use in ORR's business as usual monitoring of NR against its Network Licence; and,

(b) Contribute to considerations for Periodic Review 2023 (PR23).

1.2 Objective

1.2 To interpret and assess the current state of NR's approach to maintenance, to be able to monitor its plans and activities more effectively by:

(1) Producing a high-level summary of NR's approach to maintenance;

(2) Identify any observed areas for improvement; and,

(3) Provide recommendations, where applicable.

1.3 This relates to the NR licence conditions and NR's obligation to secure the maintenance of the network to satisfy the reasonable requirements of its customers and funders, in accordance with best practice and in a timely, efficient and economical manner.

1.3 Scope

1.4 The scope of this TAR is consolidated into three main parts:

(a) Obtain evidence of 'line of sight' between NR national maintenance policy and Regional strategy; and gain understanding of alignment of Regional maintenance strategies with respect to NR national maintenance strategy.

(b) Gather evidence of compliance with those strategies and plans.

(c) Understanding of the effectiveness of those strategies and plans, consideration of any improvements for CP7.

1.5 The TAR has considered all five Regions with a view to support answering of the following:

(a) How NR undertakes its maintenance activities;

(b) The strengths and weaknesses (or opportunities) in the way NR undertakes maintenance activities;

(c) How effective and efficient NR's maintenance activities are;

(d) The extent to which there is variance between how maintenance is undertaken across the Regions, and if so, why; and,

(e) Establishing why the cost of different maintenance activities varies between Regions.

1.4 Methodical Approach

1.6 This TAR was delivered in four steps:

(a) ORR prepared a Request For Information (RFI), a list of pertinent documents which ORR required from NR for this study. This included documents relating to policy, strategy, organisation structure, etc. The RFI is provided in Appendix A: Request For Information;

(b) Meetings with Regional representatives to provide clarification of documents provided as part of the RFI process;

(c) Interviews with a Head of Maintenance/ Infrastructure Director from each Region to identify alignment between the documentation provided via the RFI process, as well as identify themes and observations relevant to the understanding of NR's approach to maintenance; and,

(d) ORR compiled, reviewed, then identified observations and conclusions from all the information for presentation in this report.

1.7 In addition to these four steps, ORR have prepared a high-level summary of NR's maintenance organisation to facilitate the readers understanding of maintenance within NR, refer to Section 2.

1.8 This report represents a cross-section across NR taken at a point in time, at the time of writing this report NR was considering a maintenance reform programme (also referred to as 'modernising maintenance') and undertaking preliminary CP7

planning. This report does not directly consider these ongoing activities; however any findings or observations will be relevant to NR's future maintenance planning.

2. Maintenance in Network Rail

2.1 What is Maintenance?

2.1 Maintenance is the process of ensuring an asset is maintained in condition by regularly inspecting it and intervening to improve its condition, when necessary, via a maintenance activity. For example, maintenance includes clearing leaves and silt from drainage pipes; and checking the tightness of rail fastenings. It is not the undertaking of a refurbishment (i.e. major repair or partial replacement) or renewal (i.e. replacement of the asset). NR define it as, "…the day-to-day upkeep of the network. Our maintenance employees support our operations and project teams by making sure every part of our infrastructure – such as signals and power supplies, or assets such as track and bridges – is maintained and in good working order".

2.2 NR operates under its Network Licence, which requires it to comply with conditions set in the public interest. These licence conditions underpin ORR's approach to holding NR to account and in monitoring and assessing compliance. A core obligation under the licence is securing the operation, maintenance, renewal and enhancement of the network in order to satisfy the reasonable requirements of its customers and funders, in accordance with best practice and in a timely, efficient and economical manner. The licence holder shall achieve the above to the greatest extent reasonably practicable having regard to all relevant circumstances.

2.3 The international standard, ISO 55000:2014 Asset management – Overview, principles and terminology states, "an organisation's top management, employees and stakeholders should implement planning control activities (e.g. policies, processes or monitoring actions) and monitoring activities, to exploit opportunities and to reduce risks to an acceptable level". Maintenance is a process within asset management. All maintenance requirements are determined via NR's asset management policies, strategies and standards.

2.4 NR delivers maintenance of track, signalling, Electrification & Plant (E&P) and off-track (e.g. boundary and vegetation management, etc) asset types (typically known as rail systems or disciplines). Delivery is from within its organisation using internal resources and external contractors, i.e. for specialist resources or to manage fluctuations in workload. This maintenance is primarily delivered via a Maintenance Delivery Unit (MDU), whilst some maintenance work is also delivered by each regions Works Delivery unit (NR's in house contractor).

2.5 Maintenance of other asset types, including earthworks, buildings and structures is managed via NR's asset management teams and delivered by NR's supply chain, typically using framework contracts.

2.6 As the majority of NR's maintenance costs are from activities delivered by NR i.e. via the MDUs or Works Delivery. This report considers maintenance delivered by NR only.

2.2 Maintenance costs & budget

2.7 For the Period Review in 2018 (PR18) where ORR determined what NR must achieve from 2019 to 2024, the costs associated with maintaining all infrastructure assets are provided in Table 2.1. In comparison, renewals costs were determined to be £16,698 million.

Table 2.1 PR18 summary of maintenance costs

Route[1]	CP5	CP6	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
	£m	£m	£m	£m	£m	£m	£m	£m
Anglia	605	646	129	133	133	127	127	126
LNE&EM	1,234	1,467	264	293	294	297	293	290
LNW	1,425	1,862	295	377	374	373	370	367
South-East	754	1,015	165	206	204	203	201	201
Wales	280	332	59	68	68	67	66	63
Wessex	471	543	102	113	111	109	105	105
Western	619	715	140	144	149	141	140	140
Scotland	544	675	111	137	135	134	135	134
Central	291	108	5	18	44	14	14	18
GB Total	**6,225**	**7,362**	**1,270**	**1,491**	**1,512**	**1,465**	**1,451**	**1,442**

Source: 2018 periodic review final determination: Supplementary document - Review of Network Rail's proposed costs – NR Consolidated Opex databook, 2017-18 prices, post-efficient

[1] In 2018 Routes are defined pre-Putting Passengers First (PPF) re-organisation

2.1 Upon issue of the Periodic Review in 2018, the 2019 publication of NR's Delivery Plan for CP6 states maintenance spend to be circa £9 billion, recognising the substantial cost of maintain the railway. Where NR agreed to deliver a number of a maintenance tasks, known as 'volumes' for a total of £9 billion within the control period; throughout CP6 ORR monitors NR's progress against the Delivery Plan. In particular, ORR undertakes detailed reviews at each Revised Forecast (RF) at Period 4, 8 and 11 to hold NR to account against the PR18 final determination and the NR CP6 Delivery Plan. In comparison, renewals costs in the Delivery Plan were determined to be £18.5 billion.

2.2 The maintenance budget is held at Route level, by the Infrastructure Director or Head of Maintenance (refer to Figure 2.1 and Figure 2.2) who are then accountable to the regional managing director.

2.2.1 Activity Based Planning (ABP)

2.3 In the final year of CP5, NR implemented an Activity Based Planning (ABP) tool, which introduced a bottom-up maintenance resource planning process and cost estimating tool for those assets maintained by the MDUs. The tool makes a direct link between planned maintenance activity and planned costs and headcount. For example, the ABP tool would break down the number of drainage inspections in one MDU in every four-week period, along with the expected cost and headcount of this work.

2.4 The approach considers the activities (known as Maintenance Standard Tasks (MSTs)) required to maintain each asset and the labour, plant, materials and cost required to that maintenance activity.

2.5 The number of MSTs has been rationalised and standardised across all MDUs and structured to differentiate between planned maintenance (e.g. inspections, cyclical tasks, etc.) and reactive maintenance, typically known as, 'work arising', (e.g. pumping water after heavy rain, etc.).

2.6 The costs are developed using each MDUs own records of time taken to complete standard jobs, non-productive time, number of plant shifts required and labour rates, etc.

2.7 It is the responsibility of the MDU, where the Head of Maintenance/ Infrastructure Director is accountable, to maintain accurate data in Ellipse (an asset register tool) and update year to date volume actuals. NR's Activity Based Planning and Reporting Policy V0.4 sets out the procedure for using ABP to plan and report

maintenance volumes and the associated cost. It refers to planning in the context of ABP and how it links to the Ellipse and Hyperion systems.

2.3 Organisational structure

2.8 Each of NR's 14 Routes has either a Head of Maintenance or Infrastructure Director who is responsible for the delivery of maintenance and compliance with standards. At the time of writing this report, post-PPF, Regions have adopted different approach to organisational structures; there are two generic high-level organisational structures, as shown in Figure 2.1 and Figure 2.2.

Figure 2.1 Maintenance organisational structure: Scotland & Wales and Western (W&W)

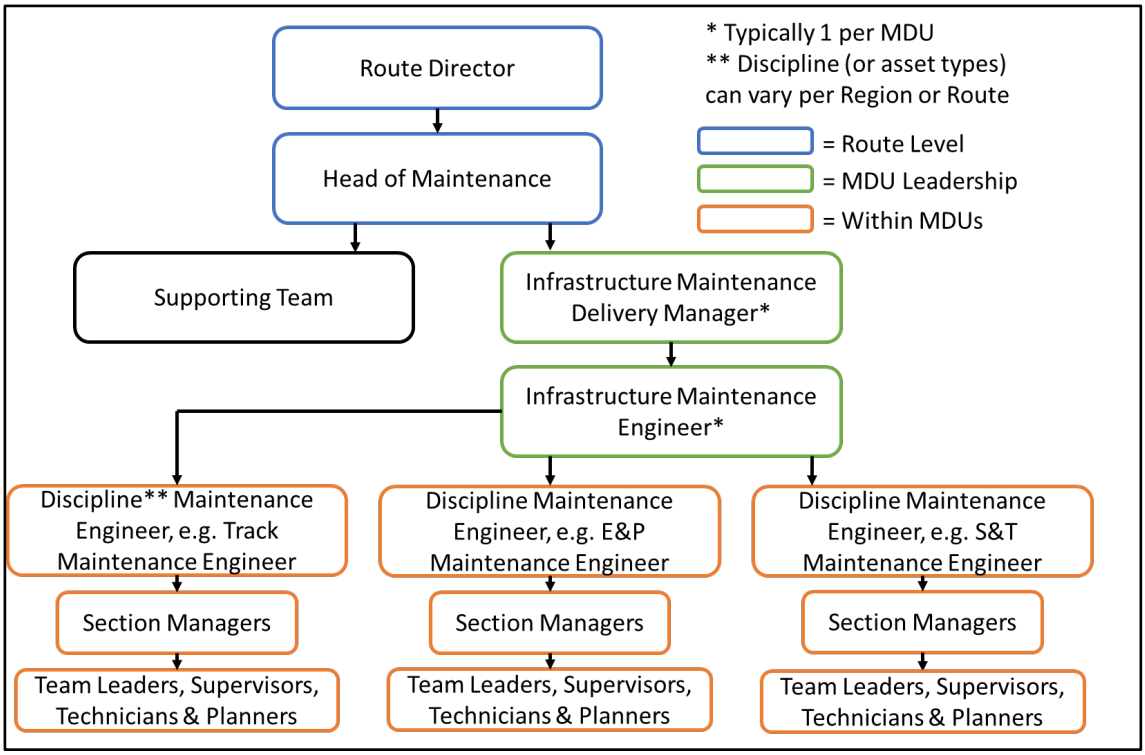
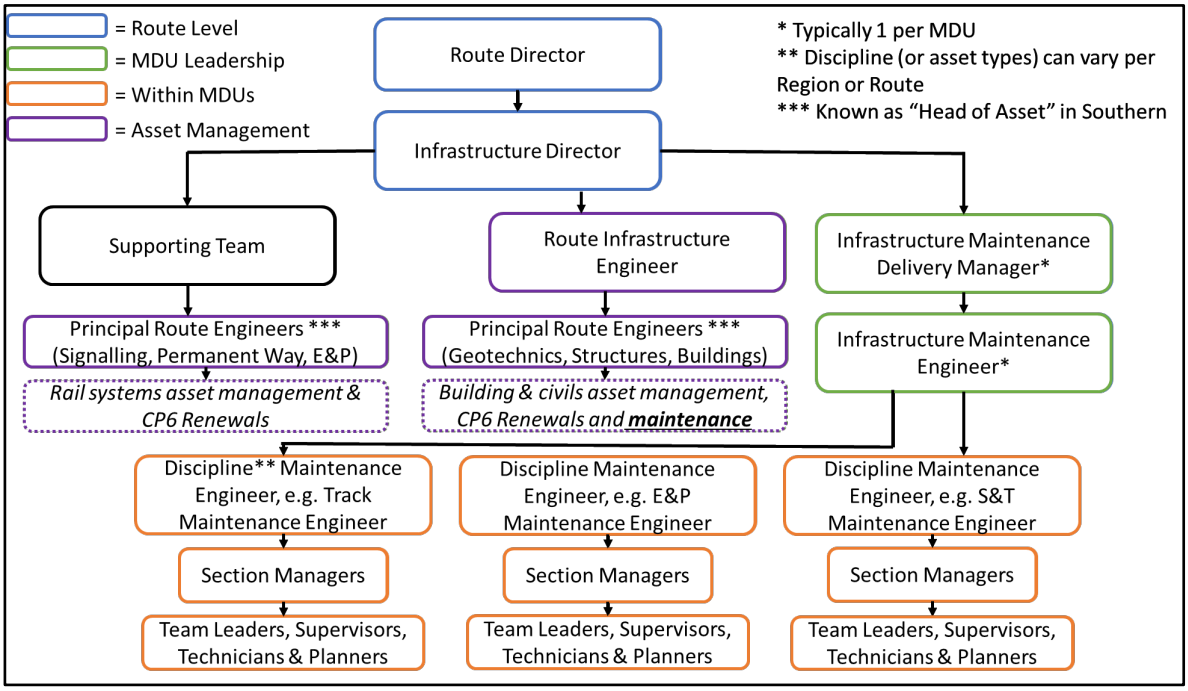


Figure 2.2 Maintenance organisational structure: Eastern, North West & Central (NW&C) and Southern



2.9 A summary of responsibilities for each role is shown below:

(a) **Route Director**: responsible for operations, maintenance and renewals in their respective Routes including the management of day-to-day delivery of train performance and relationships with their local train operating companies.

(b) **Infrastructure Director**: accountable for CP6 delivery which includes responsibility for leading and directing the development, optimisation and safe implementation of the Route Asset Management Plan (RAMP) to meet customer requirements and deliver route and network targets. The Infrastructure Director acts as a client for all route project delivery (maintenance, renewal and enhancement) throughout the project lifecycle.

(c) **Head of Maintenance**: Responsible for the CP6 delivery of maintenance within their Route. This includes the maintenance activities delivered by the MDUs only, to meet route targets.

(d) **Route Infrastructure Engineer**: responsible for the whole engineering life cycle of infrastructure assets within the Route, including maintenance, renewals and enhancements and spanning from current performance to the business planning horizon. This includes managing development and delivery of the RAMP to meet Route and network objectives.

(e) **Principal Route Engineer or Route Head of Asset – Rail Systems**:

These roles support the Route Infrastructure Engineer and specialise in just one asset type (e.g. track or signals)

(i) **Principal Route Engineer** responsible for the whole life cycle of their discipline assets within the Route from the maintenance to enhancement and from current performance to the business planning horizon. This includes the management of development and delivery of the discipline RAMP to meet Route, Region and network objectives.

(ii) **Head of Asset** leads the delivery of their disciplines RAMP for those assets within a defined geography to a medium-term horizon, this includes provision of a comprehensive support service to the Infrastructure Director and maintenance teams focussed on specified MDUs and provide a route based, single point of contact, engineering support service to maintenance teams for their discipline.

(f) **Infrastructure Maintenance Delivery Manager (IMDM)**: responsible for leading and directing the delivery of maintenance and project work within the MDU to standards and budget. This includes the continual drive for improvement in safety, business performance and efficiency. This role includes the scoping and instruction of in-year reactive renewals.

(g) **Infrastructure Maintenance Engineer (IME)**: responsible for leading and directing the maintenance engineering team in the efficient delivery of inspection, maintenance and project related works for all infrastructure assets to meet relevant standards. The roles include a requirement to drive culture transformation for safety and asset performance creating continual improvement and deliver safety, compliance and performance strategies to deliver a compliant, well performing asset.

(h) **Maintenance Engineer**: Inspections, maintenance, and faulting; supported by Assistant Engineers, Sections Managers, Team Leaders, etc.

2.10 In addition to the above, the Director of Engineering and Asset Management (DEAM) and their team sets policy and application of engineering standards for the Region; develops long term asset policies and strategies; and provides specialist engineering expertise, as required.

2.11 Regions are supported by a network wide team, the Technical Authority for NR. Focussing on train performance and safety through technical leadership, assurance

and expert support across asset management, engineering, maintenance, etc. This includes, for example, the Head of Maintenance, Principles & Standards who is the company and industry expert for maintenance, their role includes direction of the development of maintenance strategy within the context of the railway system.

2.4 MDU locations

2.12 A list of MDU locations is provided in Table 2.2.

Table 2.2 MDU locations

Region	Route	MDU
Eastern	Anglia	Ipswich Tottenham Romford
	East Midlands	Bedford Derby
	North and East	Central Leeds Central Sheffield North Middlesbrough North York
	East Coast	North Darlington North Newcastle South Doncaster South Kings Cross South Peterborough
North West & Central	North West	Lancashire & Cumbria Liverpool Manchester
	Central	Saltley Sandwell & Dudley
	West Coast South	Bletchley London Euston Stafford

Region	Route	MDU
Scotland	Scotland	Edinburgh Glasgow Motherwell Perth
Southern	Kent	Ashford London Bridge Orpington
	Sussex	Brighton Croydon
	Wessex	Wessex Inner Wessex Outer
Wales & Western	Wales	Cardiff Shrewsbury
	Western	Western Central Western East Western South