Network Rail: Project Normalisation Independent Reporter Study

Office of Rail & Road and Network Rail : Independent Reporter Framework

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CURRIE & BROWN

The Value of Certainty.

OFFICE OF RAIL AND ROAD

NetworkRail

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Glossary: List of Abbreviations

ACRONYM	DEFINITION
AFC	Anticipated Final Cost
CAF	Cost Analysis Framework
CFO	Network Rail's Chief Financial Officer Directorate
CP7	Control Period 7 (April 2024 to March 2029)
CP8	Control Period 8 (April 2029 to March 2034), nomenclature to be superseded by "FP1"
DFT	Department for Transport
ES	Engineering Stage
FP1	Funding Period 1 (April 2029 to March 2034), new nomenclature to supersede "CP8"
GRIP	Governance for Railway Investment Projects
KPI	Key Performance Indicator
NR	Network Rail
NEC4	New Engineering Contract (fourth edition), published 2017 by the Institution of Civil Engineers
NW&C	North West & Central (Region)
ORR	Office of Rail & Road
PACE	Project Acceleration in a Controlled Environment
RACM	Rail Activity Cost Model
SEU	Signalling Equivalent Unit
W&W	Wales & Western (Region)

1. Executive Summary

1.1 Executive Summary

a. Currie & Brown has been appointed jointly by the Office of Rail & Road ("ORR") and Network Rail ("NR") to provide an independent report regarding the approach taken by NR's five regions in terms of project cost normalisation.

b. The process of normalising project cost data is to convert it to the same time period, make-up, structure and conditions. This typically means stripping project specific cost details that are temporary or conditional.

c. The purpose of the review is to provide assurance to the ORR and funders that cost normalisation methods are robust, consistently applied, and provide reliable benchmarks for estimating future project costs. The specific questions the Independent Reporter has been set by NR and the ORR are:

(1) Are the processes for capturing project cost information through project life to use for normalisation, and on completion / at close, effective for normalisation activities? In particular:

- When and how is project cost data including realised risk (be that positive (opportunity) or negative (threat)) normalised for processing?
- How are the limitations of historic data (including provenance) taken into account when used to predict future costs (e.g. error bands)?

(2) Are processes for capturing project cost information being followed and if not, what action is taken?

d. The review is required to address each of the questions above by referring to the following areas of focus: and approach to be taken.

- A review of each Region's, practices and processes for storing and using historical data to derive statistical significant project costs/ cost driver / risk information (e.g. unit rates), to aid project planning.
- An analysis of how historic data is normalised when planning region Renewals work bank, focusing on the major assets within the regions plans. Major assets include electrification & fixed plant (E&FP), track, signalling (including level crossings), Telecoms, and Building and Civils (Building and Civils includes earthworks, drainage, buildings and structures).
- Identification of any other relevant practices / constraints within Network Rail that impact on the robustness of project cost driver / risk costing? Note: the reporter should not go looking for these, but where encountered as part of the review they should be identified and included in the report.

1.2 Definition

a. The Independent Reporter has used the following definition of Normalisation as provided by ORR:

> "Projects are frequently estimated in part or in total using similar historic reference projects or comparators. The data used should be representative of what is being modelled. Therefore, to obtain a robust estimate the historic data must be normalised for cost drivers such as volume, inflation, complexity and risk. ORR defines risk as an event which impacts cost/schedule, and the likelihood of its occurrence; this can be positive (an opportunity) or negative (threat). It is expected that railway specific factors such as access will also form part of this normalisation process."
>
> And:
>
> "The process of normalising data is to convert it to the same time period, make-up, structure and conditions. This typically means stripping cost details that are temporary or conditional such as:
>
> - Removing non-representative risks (such as one-offs, seasonal or regional risks),
> - Removing non-representative efficiencies (such as quantity discounts, shared-access discounting, conditional income),
> - Deflating or inflating to a given base year,

- Adjusting for schedule constraints or other schedule-driven cost drivers (such as COVID),
- Adjusting/removing other non-representative factors or conditions (such as volume, complexity, etc)."

b. Using the above definition, it is perhaps prudent to give further clarification to assist the reader. The normalised cost would be the 'clean' direct core cost to carry out a task or activity, and that task or activity would be identical irrespective of where or when it is undertaken and by whom. To find that 'clean' direct core cost, it would be necessary to strip away any exceptional and/or extraordinary costs that may be incurred specific to that particular piece of work and that project. For convenience, these exceptional and/or extraordinary costs will be referred to as 'abnormal' in this document.

c. By way of an example 30m of platform replacement using precast composite parts undertaken in rural Wales compared against the same work taking place in an urban location of a major city may at first appear similar but the project complexities attached to both would be myriad – those add-ons are the abnormals which would need to be identified and stripped away to enable like-for-like comparison of direct core costs in an efficient normalisation process.

d. The potential for 'abnormal' costs is wide and varied but examples may include (but not be limited to):

- contaminated soil removal,
- groundwater pumping / dewatering,
- poor soil requiring ground improvement,
- underground utilities,
- being in areas of archaeological / historic importance,
- restricted site access,
- traffic management requirements,
- road closures,
- limited working hours,
- protected species habitat,
- tree protection orders,
- environmental contamination

1.3 Findings to the Key Questions

Are the processes for capturing project cost information through project life to use for normalisation, and on completion / at close, effective for normalisation activities?

a. The Independent Reporter found that NR did not have an explicit prescribed policy for normalising cost data (and in particular extracting and ring-fencing the 'abnormal' costs).

b. The current NR suite of policy and procedure documents used for 'business as usual' cost planning prescribes that all activities and costs are itemised, defined, measured and valued using the standardised terminology of the Rail Method of Measurement ("RMM"), and all associated activities subordinate to a main component are collated as part of that asset's 'family' under that component cost head.

c. Using an entirely hypothetical example, a platform renewal is found to require a very large retaining wall and so following procedure the platform works would be measured and valued using the standardised definitions for platform works of the RMM and the retaining wall likewise treated under the retaining wall section, but both would then be carried forward to be incorporated into the overall cost for the platform. The result is that in high-level dashboard reporting to the senior leaders of the business, the project specific abnormal cost for the retaining wall is 'baked-in'; insofar as the abnormal cost gets consumed within the overall cost with no simple way to distinguish it from the other cost components making up the composite value. That composite value gets carried forward through the project lifecycle until it is uploaded for benchmarking.

d. The risk is that the benchmarked rate for the hypothetical platform with retaining wall is not necessarily being compared on a like-for-like basis with other projects despite sharing the same standardised definition. However, the Independent Reporter was shown that the Regions are able to identify and isolate the 'abnormal' add-on within its cost planning tools by filtering the levels of information below the high-level dashboard, but there

currently is no policy or standard in place requiring the production of a high-level statement that sets out all direct core costs and all abnormal cost.

When and how is project cost data including realised risk (be that positive (opportunity) or negative (threat)) normalised for processing?

e. From the review undertaken the allowances typically included within the overall budget for items such as contingency, inflation, etc are clearly identified up in the various gateway reviews up to obtaining a tender. Once the contract is awarded, inflation allowances are typically subsumed within the agreed contract sum, with the contingency re-baselined to reflect the anticipated risk profile required to complete the project. At the end of the project, the final account review identifies the actual cost of the project from which the accuracy of the risk provision can be established.

How are the limitations of historic data (including provenance) taken into account when used to predict future costs (e.g. error bands)?

f. The Independent Reporter was shown how Regions' historic data provides a breakdown of the project costs which provides insights into the trends of both the individual and comparable projects. This data is then collated into respective cost bands for the asset types and held in either the Regions' own localised cost books or more recently BenchSmart. BenchSmart allows a graphical representation, usually a scatter graph, on how the specific project compares against historic data.

Are processes for capturing project cost information being followed and if not, what action is taken?

g. Up until 2019 NR operated a central cost planning resource, however in 2019 an organisational restructure known as Devolution was enacted, establishing the five Regions which were delegated with responsibility to operate their own localised cost planning resource, albeit subject to overarching NR standard policies on cost planning, estimating, risk, contingency etc. NR's ongoing Devolution under CP7 has resulted in differing approaches to commercial management and contracting across its five Regions to deliver the standard policy outputs. This also includes approaches to cost planning and estimating, which can be attributed in part to all Regions having their own local, regional specific cost drivers that affect their project costs and estimates. While Devolution is intended to drive innovation, responsiveness, and efficiency, it also presents challenges to achieving consistent contract management performance and value-for-money outcomes across the enterprise.

h. Notwithstanding, NR has a suite of standards and policies mandated for national implementation in relation to cost planning, estimating, Risk and contingency. All five Regions confirmed adherence to these including those pertaining to the matter of benchmarking and standardisation. It was demonstrated to the Independent Reporter that cost plans are being carried out in accordance with RMM, and all NR governance and procedures were followed thereafter.

i. Evidence provided to the Independent Reporter demonstrated that that the cost planning and benchmarking processes flow from end-to-end of the project lifecycle, offering information that can be analysed and verified at any stage. The processes do not offer up a statement of all direct core costs and all abnormal costs at either inception or conclusion, but in the absence of a specific prescribed policy it is not required to do so.

j. However, as evidenced to the Independent Reporter, abnormal costs are identified and isolated as part of the cost planning 'business as usual' and can be found within the supporting data, but at present there is no written requirement to bring them to the surface in a high-level summary.

What are the Region's, practices and processes for storing and using historical data to derive statistical significant project costs/ cost driver / risk information (e.g. unit rates), to aid project planning?

k. NR has introduced BenchSmart as a national cost planning and benchmarking tool that standardises how project costs are compiled, captured and compared across its five devolved Regions. Using a templated cost stack aligned to the RMM, BenchSmart provides a common language and consistent rules of measurement, enabling cost plans to be structured around standardised core direct cost activities from first estimate to final account. Cost data is uploaded at key project milestones to create a robust national dataset, enabling like-for-like unit rate comparison,

improved benchmarking insight and more informed decision-making across the project, programme and enterprise lifecycle.

l. BenchSmart was mandated for renewal and enhancement works commencing after April 2024 and valued higher than £2million, however the Regions have been inputting projects below the £2million threshold and/or prior to 2024 as they can see the value of a well-resourced, robust database to draw information from. In the period between Devolution in 2019 and BenchSmart roll-out in April 2024, the Regions followed their own initiatives to capture, track and analyse cost data, broadly based around the Cost Analysis Framework ("CAF") process.

An analysis of how historic data is normalised when planning region Renewals work bank, focusing on the major assets within the regions plans. Major assets include electrification & fixed plant (E&FP), track, signalling (including level crossings), Telecoms, and Building and Civils (Building and Civils includes earthworks, drainage, buildings and structures).

m. The Independent Reporter's review has identified that the historic data is captured using the same overall cost structure with the respective benchmarks derived from dividing the cost by key quantities. For some projects there will be multiple benchmarks using the same methodology. Our analysis has identified that the overall estimate costs are not specifically adjusted for selected / secondary benchmarks.

n. In terms of data normalisation, it was shown that the Regions normalise their data when producing cost plans and estimates insofar as identifying and separating any project specific complexities ('abnormals'). It was also shown that BenchSmart has the capability to normalise and filter cost data at a high level, insofar as it can extract items such as railway possessions, irregular working hours and other project complexities, and inflation can be adjusted on historical data to achieve the same pricing point. Normalisation is available within the BenchSmart from the data contained therein however at present the benchmark graphics remain at overall component level.

Identification of any other relevant practices / constraints within Network Rail that impact on the robustness of project cost driver / risk costing? Note: the reporter should not go looking for these, but where encountered as part of the review they should be identified and included in the report.

o. Taking into consideration the purpose of this review, the Independent Reporter made a number of observations. These are summarised overleaf at section "1.2 Summary of report recommendations".

Acknowledgements

p. The Independent Reporter team would like to thank the staff from the ORR and NR that supported the review with their time and expertise

Conflict of Interest Disclaimer

q. This report has been prepared independently for the ORR and NR. Currie & Brown does not, to its knowledge, have any actual or potential conflict of interest that may arise from undertaking this assignment.

r. This Report is provided to Network Rail and the ORR for their benefit only. Any disclosure of the Report is on a non-reliance basis, and Currie & Brown UK Ltd has no liability to any such recipient in relation to it.

1.4 Summary of report recommendations

a. The Independent Reporter makes the following recommendations and it is the Independent Reporter's view that the following priorities are suggested:

- Critical (Do Now) – to increase the likelihood of a successful outcome it is of the greatest importance that the portfolio should act immediately.
- Essential (Do By) – to increase the likelihood of a successful outcome the portfolio should act soon.
- Recommended – the portfolio should benefit from the uptake of this recommendation.

Table 1: Summary of report recommendations

Ref.	Recommendation	Evidence	Report Section	Reporter's Suggested Priority	Exit Criteria
1	It is recommended that NR reminds its Supply Chain that compliance with RMM is mandated policy and a measurable KPI. It is suggested that NR reminds its Supply Chain that the policy must be adhered to (and perhaps offer workshops or masterclass for those unfamiliar or requiring a refresher).	Regions advising that Suppliers fail to properly engage with RMM despite it being mandated to approved tenderers and a measurable KPI against approved supplier frameworks.	6.3 Findings (RMM)	Critical (immediate)	RMM compliance is adhered to by Supply Chain in estimates, tender returns and final accounts.
2	It is recommended that a Cost Plan template distinguishing, summarising and ring-fencing abnormal costs from core costs be introduced if a normalisation policy is to be implemented	RMM "Summary of Costs" is not templated to distinguish abnormal costs from core costs. Without a supporting statement of some description, it would take forensic audit of the detailed estimate to distinguish normals from abnormals. Similarly, PACE ES3 high-level cost plan makes no templated distinction for normalisation and relies entirely on the diligence of the user to manually record that an abnormal cost has been incorporated	5.8 Standardisation of Cost Estimating & 5.9 Level of Detail	Critical	Revised Cost Plan templates and normalisation procedure implemented in preparation for the next funding period.

Ref.	Recommendation	Evidence	Report Section	Reporter's Suggested Priority	Exit Criteria
3	It is recommended NR introduce a Normalisation specific mandate if to implement a standardised and uniform approach to normalising cost data.	NR's current policies and standards do not explicitly state that normalisation of costs should take place during benchmarking process.	5.11 Benchmarking of cost	Essential	Revise procedure document to implement normalisation procedure
4	It is recommended NR seek to include 'Submission of Final Account Statement in RMM Format' as a milestone from the first iteration of the contractor's (NEC4) clause 31 programme. By doing so it places a clear and unambiguous obligation on the contractor that the contract cannot be deemed complete until it has fulfilled this contractual requirement	Regions advised that supply chain submits documents that do not comply with RMM leading to difficulties in reconciling data for benchmarking	6.3 Findings (RMM)	Recommended	RMM compatible final account statement received from Contractor that can be used for direct upload to BenchSmart

2. Background

This section outlines the background, purpose, and scope of the independent review into Network Rail's approach to project cost normalisation, including the key questions and areas of focus guiding the assessment. It also highlights the limitations of the findings, noting reliance on provided documentation and a high-level review of regional historic data practices.

2.1 Introduction

a. Currie & Brown has been appointed by the Office of Rail and Road ("ORR") to provide an independent report regarding the approach taken by Network Rail's five regions in terms of project cost normalisation.

2.2 Purpose of the review

a. The purpose of the review is to provide assurance to the ORR and funders that cost normalisation methods are robust, consistently applied, and provide reliable benchmarks for estimating future project costs. The specific questions the Independent Reporter has been set raised as part of the scope by NR and the ORR are:

   i. Are the processes for capturing project cost information through project life to use for normalisation, and on completion / at close, effective for normalisation activities? In particular:

      - When and how is project cost data including realised risk (be that positive (opportunity) or negative (threat)) normalised for processing?
      - How are the limitations of historic data (including provenance) taken into account when used to predict future costs (e.g. error bands)?

   ii. Are processes for capturing project cost information being followed and if not, what action is taken?

   The review is required to address each of the questions above by referring to the following areas of focus and approach to be taken.

   (1) A review of each Region's, practices and processes for storing and using historical data to derive statistical significant project costs/ cost driver / risk information (e.g. unit rates), to aid project planning.

   (2) An analysis of how historic data is normalised when planning region Renewals work bank, focusing on the major assets within the regions plans. Major assets include electrification & fixed plant (E&FP), track, signalling (including level crossings), Telecoms, and Building and Civils (Building and Civils includes earthworks, drainage, buildings and structures).

   (3) Identification of any other relevant practices / constraints within Network Rail that impact on the robustness of project cost driver / risk costing? Note: the reporter should not go looking for these, but where encountered as part of the review they should be identified and included in the report.

2.3 Limitations to the report findings

a. The Independent Reporter has identified the following limitations and caveats that apply to the findings in this report:

   i. Based solely on the documentation provided by NR

   ii. In respect of historic data the Independent Reporter have looked at how Regions address this on a holistic basis by interrogating the primary asset types undertaken by the respective regions.

3. Methodology

This section describes the methodology used to carry out the review, outlining a six-phase approach from mobilisation and evidence gathering through to analysis, reporting, and final submission. It explains how data was collected, validated, and refined through stakeholder engagement to ensure a structured and transparent assessment process.

3.1 Methodology

a. At the review commencement meeting between Currie & Brown, Network Rail and the ORR, the methodology depicted below was agreed.

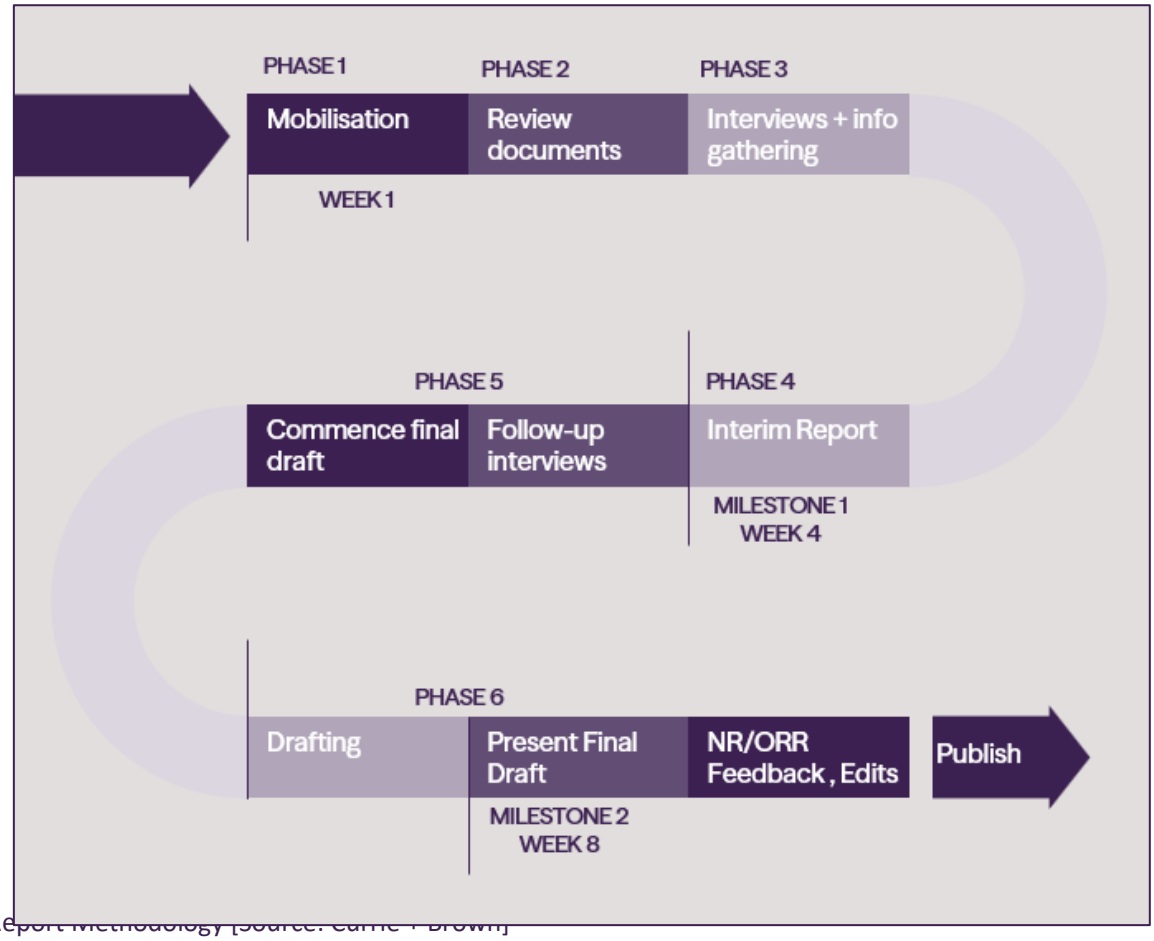

Figure 1: Report Methodology [Source: Currie + Brown]

b. Dividing the execution of the report into six phases ensured a clear and manageable approach that allowed for regular interface with the ORR and NR to keep all parties informed of progress throughout the assignment.

3.2 Mobilisation [Phase 1]

a. The mobilisation stage began with the commencement meeting, at which, the methodology and schedule were agreed.

b. To assist in Phase 1 and Phase 2, NR made its cost planning process manuals and procedures available for review prior to the initial meetings with appropriate representatives from the 5 Regions.

3.3 Evidence Gathering [Phase 2 + 3]

a. The evidence gathering phase commenced with review of documentation by the reporter team and concluded with the scheduled interviews with representatives from the 5 Regions.

b. The purpose of this Phase 3 was to understand:

   i. Were the Organisational mandated processes for capturing project cost information being followed and if not, what action was being taken?

   ii. How had the Regions been normalising (in other words 'clean' its costs to a core direct cost for benchmarking purposes) when planning its Renewals work bank during CP7?

   iii. How had the Region stored and used its local historical data to derive its project costs/unit rates when project planning during CP7?

   iv. When was project cost data normalised for processing? This was not focussed at central/corporate level but at the local, regional level

   v. What was the source of historical intelligence drawn upon when producing cost plans?

   vi. Whether there were any limitations of applying historic data when used to forecast cost models?

3.4 Interim Findings [Phase 4]

a. The interim findings and the residual lines of inquiry that remained were presented for discussion with the ORR and NR.

b. Comments, thoughts and feedback were gratefully received from the ORR, with clear direction as which areas to place greater attention to.

3.5 Report Preparation [Phase 5]

a. Following the interim findings presentation and feedback, follow-up interviews were arranged with various Regions to follow up residual lines of enquiry. Drafting commenced and was undertaken during this Phase 5.

3.6 Report Submission [Phase 6]

a. The report was produced across four iterations: a draft report that built on the interim findings previously presented, which was then refined following feedback received from the ORR and NR.

b. The resulting final report that incorporated the feedback provided was then shared with the ORR and NR, thereby concluding the review.

4. Normalisation

This section defines project cost normalisation, explaining how 'abnormal' project-specific costs are identified and removed to derive consistent, comparable core costs for benchmarking. It also outlines the practical benefits of normalisation and examines how Network Rail's tools, such as BenchSmart, support standardisation.

4.1 Definition

a. The Independent Reporter has used the following definition of Normalisation as provided by ORR:

> "Projects are frequently estimated in part or in total using similar historic reference projects or comparators. The data used should be representative of what is being modelled. Therefore, to obtain a robust estimate the historic data must be normalised for cost drivers such as volume, inflation, complexity and risk. ORR defines risk as an event which impacts cost/schedule, and the likelihood of its occurrence; this can be positive (an opportunity) or negative (threat). It is expected that railway specific factors such as access will also form part of this normalisation process."
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> "The process of normalising data is to convert it to the same time period, make-up, structure and conditions. This typically means stripping cost details that are temporary or conditional such as:
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> - Removing non-representative risks (such as one-offs, seasonal or regional risks),
> - Removing non-representative efficiencies (such as quantity discounts, shared-access discounting, conditional income),
> - Deflating or inflating to a given base year,
> - Adjusting for schedule constraints or other schedule-driven cost drivers (such as COVID),
> - Adjusting/removing other non-representative factors or conditions (such as volume, complexity, etc)."

b. Using the above definition, it is perhaps prudent to give further clarification to assist the reader. The normalised cost would be the 'clean' direct core cost to carry out a task or activity, and that task or activity would be identical irrespective of where or when it is undertaken and by whom. To find that 'clean' direct core cost, it would be necessary to strip away any exceptional and/or extraordinary costs that may be incurred specific to that particular piece of work and that project. For convenience, these exceptional/extraordinary costs will be referred to as 'abnormal' in this document.

c. The potential for 'abnormal' costs is wide, varied and myriad but examples may include (but not be limited to): contaminated soil removal, groundwater pumping / dewatering, poor soil requiring ground improvement, underground utilities, being in areas of archaeological/historic importance, restricted site access, traffic management requirements, road closures, limited working hours, protected species habitat, tree protection orders, environmental contamination and much, much more. In short, 30m of platform replacement using precast composite parts in rural Wales and 30m of platform replacement using precast composite parts in an urban location of a major city may sound similar but the project complexities attached to both would be wide and varied – those are the abnormals which would need to be identified and stripped away to enable like-for-like comparison of direct core costs in an efficient normalisation process.

4.2 Normalisation – Benefits in Practice

a. Normalising unit rates is one of the most useful steps that can be taken to improve the accuracy and reliability of long-term cost planning and is vital to accurate and reliable benchmarking. Benefits arise from normalisation of

unit rates due to data being rendered consistent, comparable and meaningful; and, conceptually, this is achieved by finding the 'true' underlying costs through a process of stripping out project-specific anomalies such as (but not limited to) project type or size, location, market conditions and inflation, procurement route, contractor pricing strategies and specific scope inclusions/exclusions. As mentioned above, for convenience, this category of cost will be referred to as 'abnormal' in this document.

b. By applying a process to find the 'clean' underlying cost, the data can be used to compare costs between years, regions and/or project types without distortions. Further, when having established a dataset of 'true' underlying costs more accurate long-term cost planning can be undertaken with reduced risk of under/over estimating future budgets because where unit rates are adjusted for project specific inflation/indexation, complexities, geography and other unique factors forecasts become far more reliable and give greater visibility.

4.3 Identifying Normal/Abnormal Costs

a. For benchmarking to have any validity, the data offered up for it must be normalised so that it can be used, considered and compared on a like-for-like basis and this is entirely dependent on the core cost being isolated by thoroughly stripping out of all 'abnormal' additions.

b. Network Rail has developed internal cost-capture and benchmarking tools, including BenchSmart, to support the consistent recording and analysis of project cost information. These tools are intended to enable benchmarking and transparency.

c. BenchSmart has been introduced by NR as an enabler to aid standardisation across the organisation. BenchSmart is a national cost planning and benchmarking tool that standardises how project costs are built, captured and compared across its five devolved Regions. Using a templated cost stack aligned to the Rail Method of Measurement ("RMM"), BenchSmart provides a common language and consistent rules of measurement, enabling cost plans to be structured around standardised core direct cost activities from contract award to final account.

d. The objective of BenchSmart is that cost data is uploaded at key project milestones to create a robust standardised national dataset, enabling like-for-like unit rate comparison, improved benchmarking insight and more informed decision-making across the project, programme and enterprise lifecycle.

e. By way of example, a 'Project on a Page' screenshot is given below at Fig.2 from BenchSmart (although any identifying information has been removed in the interests of maintaining commercial sensitivity).

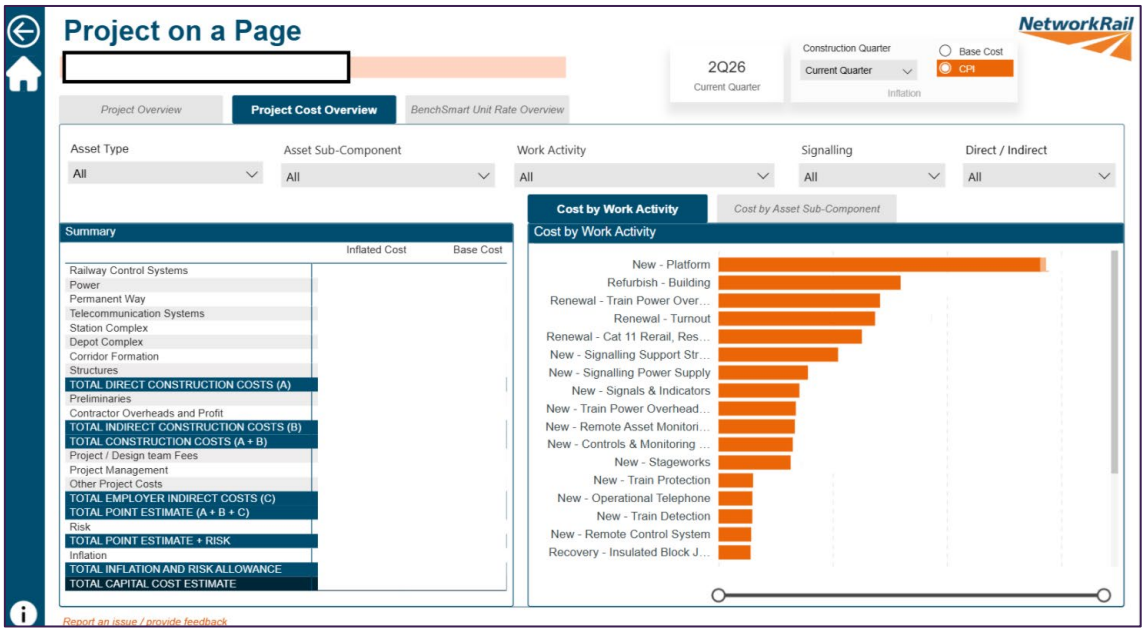

Figure 2: Screenshot, BenchSmart Project on a Page, "Project Cost Overview" tab [Source: Network Rail]

f. In the Independent Reporter's opinion, the dashboard format "Project Cost Overview" shown in Fig.2 above is a good example of how to correctly and professionally present all the key information to senior leaders and stakeholders to demonstrate the successful commercial management of a project, in compliance with the NR governance and good industry practice. As can be seen, the table to the left shows the itemised elemental breakdown of the overall project cost, following the RMM format. The bar chart to the right illustrates how the money has been/will be spent. However, what this does not do is identify and distinguish its abnormal costs from the normalised costs.

g. Contrary to their names '*Indirect Construction Costs*' and '*Other Project Costs*' are not abnormal costs in the context of this review. Indirect Construction Costs are the preliminary and overhead costs, which are supervisory and financing costs predominately (but not exclusively) driven by time rather than physical delivery outputs; Other Project Costs are project specific standalone items outside of the main contract's scope, for example the project may require, say, an agreement with a third party landowner. In an all-encompassing normalisation process the sort of costs as those described would need to be captured, isolated and normalised however for the principal emphasis and focus of this document is to look at the first principles of normalising the direct core construction costs.

h. In Fig 2, above the abnormal costs would be 'baked into' the Direct Construction Costs. That means that whilst the orange bar chart to the right shows in ascending order of value where money is being spent, it does not however indicate what is actually incorporated within that sum nor make it readily identifiable to pick out.

i. Hence, and creating a hypothetical scenario, the information shows that in the middle of the pack, Signalling Power Supply would have a considerable cost assigned against it, but does that represent a straightforward like-for-like activity, exactly the same as other similar projects in the region, or did it require something unique, specific and/or extra over to the norm? From this dashboard 'Project On A Page' there is no visible identifier of any abnormal cost and so it is not possible to ascertain normalisation.

j. However a third tab is visible in Fig.2 above named "BenchSmart Unit Rate Overview". By selecting and following through, it leads to the screen as shown in Fig.3 below.

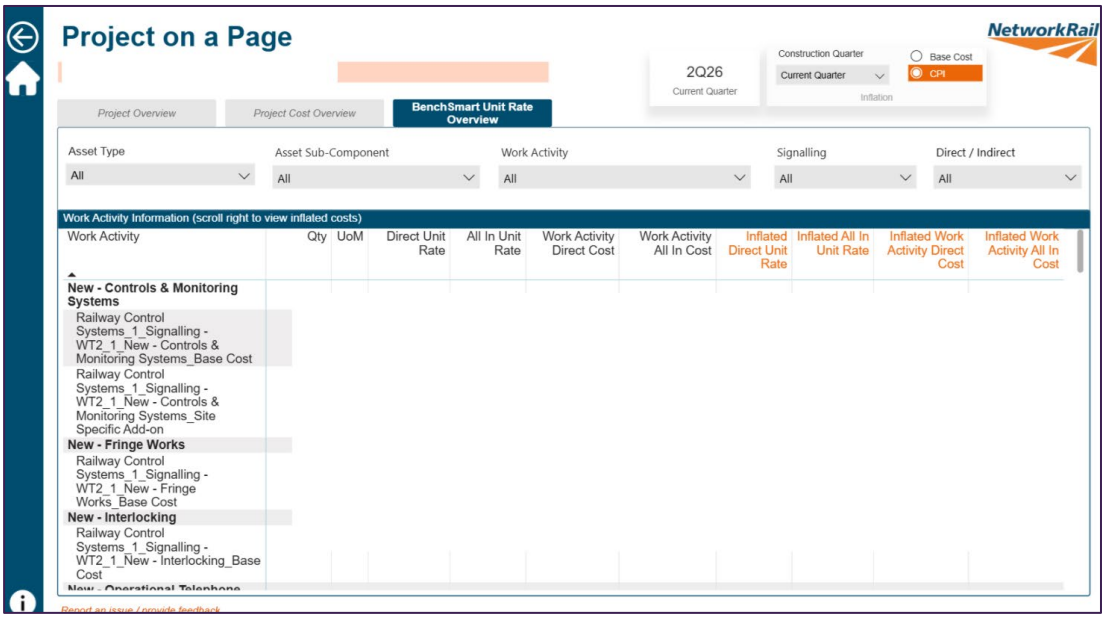

Figure 3: Screenshot, BenchSmart Project on a Page, "BenchSmart Unit Rate Overview" tab [Source: Network Rail]

k. As with previous Fig2, in the interests of commercial confidence and sensitivity all identifying reference and cost information has been redacted from Fig.3, however it serves its purpose by displaying in the second row of cost items "…. Site Specific Add-on".

l. Whilst the Project Cost Overview (Fig. 2) tells its audience what the overall cost is for the greater 'asset category' (in this hypothetical scenario Signalling Power Supply being the asset category), the Unit Rate Overview tab (Fig.3) displays the specific work activities that have been collated to calculate the asset category cost shown on the 'Project Cost Overview' and in particular that a project specific complexity has been identified, considered, measured and valued in isolation as an abnormal cost subordinate to the greater 'asset family'.

m. This shows that the processes and systems NR currently has in place can separate its abnormal costs from its clean, direct core costs at the component level, but there is no specific differentiation between normalised and abnormal costs at the highest dashboard level.

n. The following pages investigate the processes NR currently has in place to standardise its approach to cost planning and estimating, and to identify and separate its abnormal costs from its clean, direct core costs.

5. NR's cost capture and normalisation process and systems

This section outlines Network Rail's cost capture, planning, and benchmarking processes, including the impact of regional devolution, mandated standards, and tools such as RMM and BenchSmart. It evaluates how these systems support cost consistency and standardisation across the project lifecycle, while highlighting gaps in explicitly defining and separating 'abnormal' costs.

5.1 Network Rail and the Regions

a. Up until 2019 NR operated a central cost planning resource, however in 2019 an organisational restructure known as Devolution was enacted, establishing the five Regions which were delegated with responsibility to operate their own localised cost planning resource, albeit subject to overarching NR standard policies on cost planning, estimating, risk, contingency etc. The five Regions are:

Eastern
North West & Central ("NW&C")
Scotland's Railway
Southern
Wales & Western ("W&W")

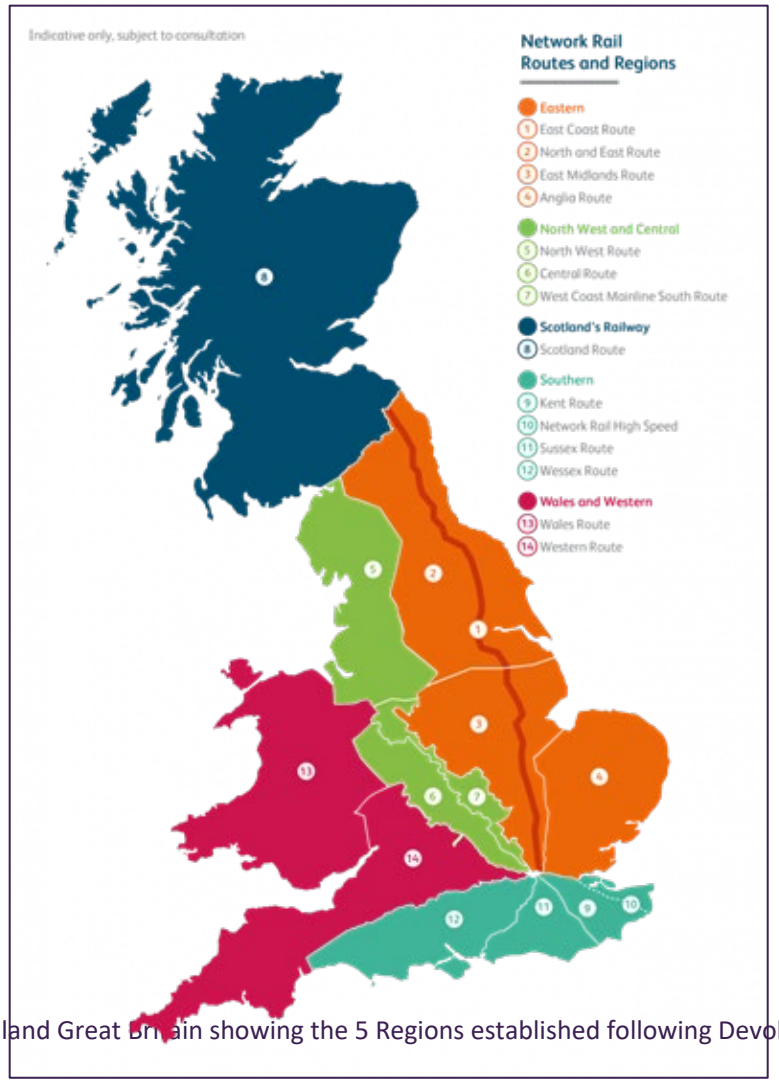

Figure 4: Map of Mainland Great Britain showing the 5 Regions established following Devolution [Source: Network Rail]

5.2 Devolution and Collaboration

a. Since devolution, the five Regions have chosen to act collaboratively in respect of cost-planning methodology and techniques, using a range of reports, benchmarking and cross-regional forums to share best practice and promote consistency of cost planning approach. This collaborative activity is supported by Network Rail's Chief Financial Officer Directorate ("CFO").

5.3 Mandated Processes

a. NR has a suite of standards and policies mandated for national implementation in relation to cost planning, estimating, Risk and contingency and all five Regions confirmed adherence to these; including those pertaining to benchmarking and standardisation. All five Regions confirmed that the mandated processes contained within these policies and standards are being followed.

b. With cost planning devolved to the five Regions, governance and methodological ownership now sits locally. To support consistency and robustness, the Region and central Network Rail's Chief Financial Officer (CFO) Directorate have taken a collaborative approach sharing best practice and aligning methods to ensure a coherent, organisation-wide application of the mandated process.

c. Through collaborative action the reviewing and maintaining of the latest movements with current and historic price indices ensures regional tools are informed with the latest information to guarantee cost plans; budgets and authority submissions are supported with the most accurate information available.

5.4 PACE

a. When considering cost planning of a project, NR measures that particular project's maturity against the PACE lifecycle. PACE (Project Acceleration in a Controlled Environment) by mandate effective 01 June 2024 supersedes the GRIP (Governance for Railway Investment Projects) process formerly used by NR.

b. PACE is intended to be more streamlined and offer greater flexibility than GRIP. Furthermore, PACE seeks to encourage a climate of continual change and improvement in all disciplines:

> "Projects should learn from lessons throughout the PACE lifecycle to better inform current and successor projects, support decision making, increase stakeholder confidence, maximise efficiencies and avoid repeat mistakes."

c. Conceptually, PACE identifies four distinct lifecycle milestones/stages:

- Strategic Development and Project Selection;
- Project Design;
- Project Delivery; and
- Project Close

d. The sub-stages within each of the above are known with the prefix ES (Engineering Study), and the diagram at Fig. 5 overleaf shows the PACE project lifecycles, the subordinate ES stages contained within, how it overlays the superseded GRIP stages and also how it corresponds to the type of cost plan appropriate to that ES stage in the project lifecycle.

GRIP Stage	1 Output Definition	2 Pre-Feasibility	3 Option Selection	4 Single Option Development	5 Detailed Design	6 Construction Testing and Commission	7 Scheme Hand back	8 Project Close Out
PACE Phase	Strategic Development & Project Selection			Project Design		Project Delivery	Project Close	
PACE Milestone	ES1 - Client requirement defined and baselined	ES2 - Constraints identified & project feasibility confirmed	ES3 - Single option identified and enclosed	ES4 - Design standards approved and Approval in Principle	ES5 - Construction ready design approved	ES6 - Construction complete	ES7 - Project demobilised and handed back to sponsor	ES8 - Contractual accounts settled, formal closeout
Cost Plan Type	Order of Magnitude Cost Plan	Outline Budget Cost Plan	Quantified Cost Plan	Definitive Cost Plan	Detailed Cost Plan	Detailed Cost Plans based on Actual Costs of Work Done, Contractual Cost Forecast and Estimated Future Costs		

Figure 5: Definition of Cost Plans through the GRIP and PACE project lifecycles [Source: Network Rail]

e. With regard to cost planning, the level of sophistication and detail required is dependent on the maturity of the scope and/or design, as shown in the diagrams Fig.5 above and Fig.6 overleaf.

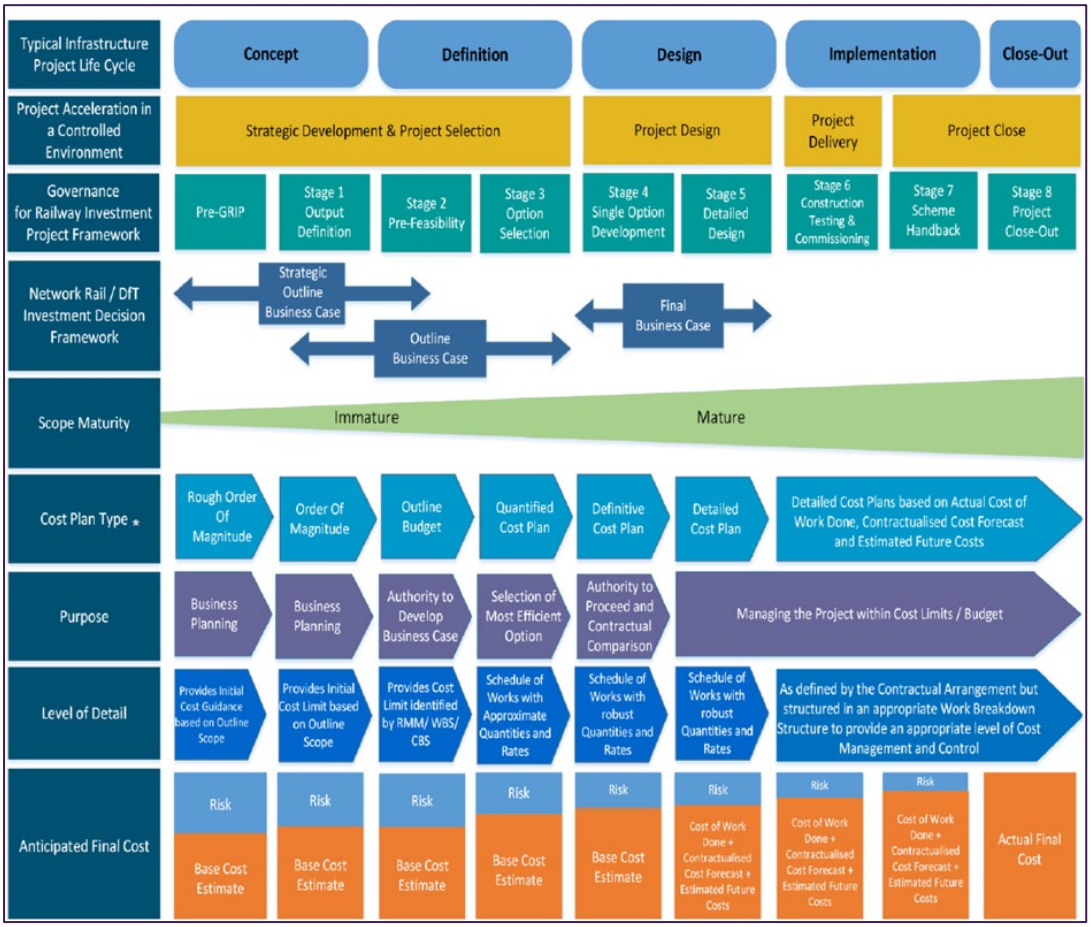

Figure 6: Table showing the purpose and level of detail of the cost plan in relation to its GRIP/PACE stage [Source: Network Rail]

5.5 Immediacy of Workbank

a. In conjunction with a project's maturity when measured against PACE, the immediacy of a project also has a significant bearing on the approach to a Region's cost planning process. Immediacy can be categorised as follows:

- Live project
- Workbank
- Volume

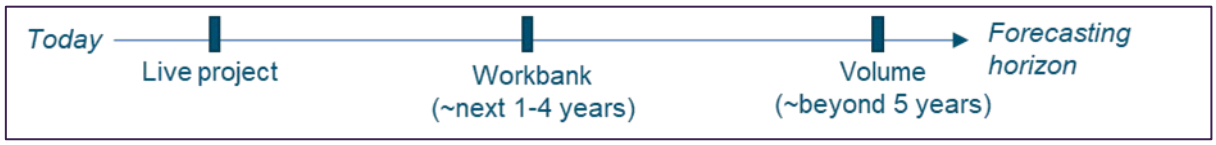

Figure 7: Infographic to illustrate the immediacy of projects [Source: Network Rail]

With regard to the Regions, these category heads can be defined as:

Live Project:

b. An immediate activity and/or intervention which has a 'live' cost estimate based on supplier estimates or internal Network Rail quantity surveyor estimates. The scope and design is usually suitably advanced and mature enough for cost certainty, so risk is applied accordingly. The degree of scope maturity is sophisticated enough for a detailed cost plan (Engineering Stage 4/5)

Workbank:

c. Renewal work and/or intervention anticipated to take place within the forthcoming 1 to 4 years (in other words, within the current Control Period). The maturity of scope and design should be sufficient to make informed, substantiated assessments and there should be sufficient knowledge available about the location and project complexity to identify 'abnormal costs' and forecast Risk will be a combination of substantiated known foreseeable risks and contingency for unforeseen events. The cost planning output would align with Engineering Stage 3 and be a high-level quantified cost plan.

Volume:

d. Works being considered 5+ years ahead, (in other words in later Control Periods). Little detail will be known about the project aside a potential location, and high-level generic output. Such items would require an order of magnitude cost estimate, usually a top-down estimate calculated by applying a proposed volume against national or regional 'standard' unit costs to create a volume-based forecast.

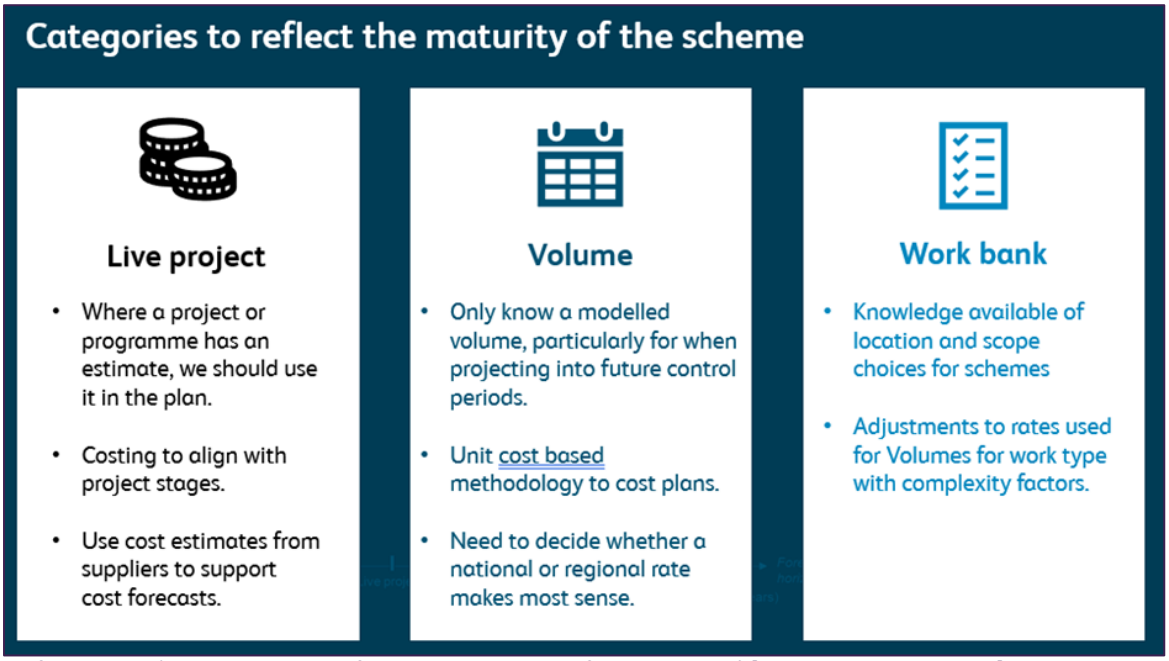

Figure 8: Infographic, 'Categories To Reflect The Maturity Of The Scheme' [Source: Network Rail]

5.6 Standardisation of Cost Estimating

a. All Regions are mandated that all costs shall be structured and measured in accordance with the Rail Method of Measurement 1 (RMM1).

b. The production of all Cost Plans and Cost Advice shall be ordered in accordance with the basic Cost Categories and Group Elements as described in RMM Volume 1 – Cost Planning as set out in Fig.9 below:

	0		
	Summary of Group Element Costs		
RMM Vol 1	Group Element	Total Cost £	% Notes
1	Direct Construction Works		
1.01	Railway Control Systems	£0	

Figure 9: Standard front page summary template for an RMM estimate [Source: Network Rail]

c. NR mandates that:

> "The Cost Category **Direct Construction Works**, and Group Elements, shall be estimated based upon the nett cost for Labour, Plant and Materials (or composites thereof) exclusive of Main Contractor Preliminaries, Main Contractor Overhead and Profit and the derived Risk Allowance through the Risk Assessment process. There shall be no provision for Contingency items included in the **Direct Construction Works** element of the Cost Plan."

d. As can be seen from the above quoted definition, very early on in a project's lifecycle (on or around Outline Budget stage / Engineering Stage 2) best endeavours are made to standardise its cost planning process by using the same specific criteria and core elemental cost components in substantiating its estimate. However, it does not seek any distinction between 'clean' direct core costs vs. 'abnormal' costs because as earlier advised Prelims, Overheads, Risk and Contingency are not project specific abnormals in the context of this exercise.

e. And so, using an entirely hypothetical scenario should a platform require a substantial retaining wall to one side of it the correct process as mandated would be that the Platform work would be measured and quantified in accordance with the RMM definition for Platform work. Upon discovery that a Retaining Wall was required to

complement the Platform, that too should be administered in accordance with the RMM but separate from the Platform and instead treated using the RMM definition for Retaining Walls.

f. As seen in the screenshots earlier at Fig 2 and Fig 3, the Retaining Wall costs would be collated under the asset category to which it is subordinate to, in this hypothetical scenario that would be Platform. The high-level dashboard ("Project Cost Overview") would show the full cost to be spent on platform works, including the retaining wall, however the data would be available to filter at the next level down at the 'BenchSmart Unit Rate Overview"

g. By following the current mandated process, the cost of the Platform has derived from the same standardised core pricing components, which would be common to all other platforms priced under RMM taxonomy anywhere within NR nationwide, and this should assist in normalisation by enabling direct like-for-like comparisons. At the same time, the 'abnormal' element has been isolated by being priced separately within the overall RMM cost estimate. The data exists but at a regional user level and not in a summarised collated format that shows a project cost build-up in terms of direct clean core costs and project specific abnormal costs.

Recommendation
Cost Plan templates, including RMM summary sheets, to distinguish and ring-fence abnormal costs from core costs if normalisation is to be implemented
Exit Criteria
Revised Cost Plan templates and normalisation procedure implemented

5.7 Level of Detail

a. The cost plan type is determined directly by the maturity of scope and design and the PACE lifecycle stage, which in turn determines the level of detail required from the cost plan and as can be seen from the table at Fig. 5 earlier and reproduced below at Fig.10:

b.

GRIP Stage	1 Output Definition	2 Pre-Feasibility	3 Option Selection	4 Single Option Development	5 Detailed Design	6 Construction Testing and Commission	7 Scheme Hand back	8 Project Close Out
PACE Phase	Strategic Development & Project Selection			Project Design		Project Delivery	Project Close	
PACE Milestone	ES1 - Client requirement defined and baselined	ES2 - Constraints identified & project feasibility confirmed	ES3 - Single option identified and enclosed	ES4 - Design standards approved and Approval in Principle	ES5 - Construction ready design approved	ES6 - Construction complete	ES7 - Project demobilised and handed back to sponsor	ES8 - Contractual accounts settled, formal closeout
Cost Plan Type	Order of Magnitude Cost Plan	Outline Budget Cost Plan	Quantified Cost Plan	Definitive Cost Plan	Detailed Cost Plan	Detailed Cost Plans based on Actual Costs of Work Done, Contractual Cost Forecast and Estimated Future Costs		
Purpose	Business Planning	Authority to Develop and Business Case	Selection of Most Efficient Option	Authority to Proceed and Contractual Comparison	Project Cost Control	Managing the Project within the Cost Limits / Budget		
Level of Detail	Provides an Initial Cost Limit based on an Outline Scope	Provides Cost Limit identified by WBS / CBS	Schedule of Works with Approximate Quantities and Rates	Schedule of Works with robust Quantities and Rates	Schedule of works with robust Quantities and Rates	As defined by the Contractual Arrangement but structured in an appropriate Work Breakdown Structure to provide an appropriate level of Cost Management and Control		

Figure 10: Definition of Cost Plans through the GRIP and PACE project lifecycles [Source: Network Rail]

c. On or around Engineering Stage 4/5 a definitive cost plan, with a schedule of works and robust quantities and rates is the requirement. Usually by this stage Contractor's estimates (based on detailed RMM bills of quantities and/or activity schedules) will be used to substantiate the funding request and due to the maturity of scope and design, and form of contract having been determined, the amount of Risk will be more readily foreseeable and quantifiable.

d. Overleaf, at Fig.11, is a screenshot of a BenchSmart cost capture template. The left side (up to and including 'Total Cost') follows the RMM format; each activity head, in this case Earthworks is broken to subcategories, such as Embankments, which is then broken down further to sub-subcategories of specific measurable activities. Each sub-subcategory has its own unique identifier code; this aids both applications for payment, as well as benchmarking as the same identifier code and description is used on a like-for-like basis across various projects. The right side of the template shows the Asset Family, Asset Sub-component, work activity list and work activity method applicable to each line. By applying this common terminology under these heads it makes the data accessible for filtering and interrogation in BenchSmart.

Level	RMM Code	Item	Description	Bill Quantity	UoM	Rate	Total Cost	Asset Family	Asset Sub-Component	Work Activity List	Work Activity Method
2	1.07		Civil Engineering		m						
3	1.07.01		Earthworks		m2						
4	1.07.01.02		Embankments		m2						
	1.07.01.02.01		General Excavation	649	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.01		Light scaling	9	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.01		Reprofile works (area A2)	311	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.01		Reprofile works (Area C2)	163	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.01		Excavate spur line and stockpile for reuse	700	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.02		Disposal	1,132	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.02		Disposal of old railway waste on embankment	1	Item			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.03		Filling; Class A (area B1)	3,945	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.03		Filling; Class A (area A2)	2,479	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.03		Filling; Class A (area C2)	781	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.03		Filling to spur line reinstatement from stockpile	1,295	m3			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.02.03		Filling: Class 6A to shear key	350	m3			Corridor Formation	Embankments	Embankment	Renew
4	1.07.01.04		Preventative Earthworks		m2						
	1.07.01.04.05		Soil nailing: mobilisation and demobilisation	1	Item			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.04.05		Soil nails: 14m long galvanised Dywidag Self Drilling Hollow Core R32-320 threaded bar in 100mm diameter grout filled bores	226	Nr			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.04.05		Soil nailing: Suitability testing of sacrificial nails	3	Nr			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.04.05		Soil nailing: Acceptance tests	4	Nr			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.04.05		Soil Nailing: Grout cube sampling and testing	1	Item			Corridor Formation	Embankments	Embankment	Renew
	1.07.01.04.06		Geobugg Tecco G45/2 mesh with small apertures including spike plates, hook pins, anchorage cables and fittings	800	m2			Corridor Formation	Embankments	Embankment	Renew
3	1.07.08		Retaining Walls		m2						
4	1.07.08.02		Retaining Walls		m2						
	1.07.08.02.06		Interlocking Sheet Piles; mobilisation and demobilisation	1	Item			Corridor Formation	Embankments	Embankment	Renew
	1.07.08.02.06		Interlocking Sheet Piles; distribute to work positions	1	Item			Corridor Formation	Embankments	Embankment	Renew
	1.07.08.02.06		Interlocking Sheet Piles; Supply EZ19-700	40	m2			Corridor Formation	Embankments	Embankment	Renew

[Source: Network Rail]

Work Bank:

For works with an emerging scope and design at or around PACE Engineering Stage 3, the requirement would be a schedule of works with approximate quantities and rates, derived from RMM and result in a quantified cost plan prepared to give the Business suitable confidence to strategize and select the most efficient option to proceed. Assuming early contractor involvement has not been instigated, the cost data would be drawn from the Region's own repository of benchmarked and normalised costs for core, direct costs aligned to RMM definitions, derived from previous and historic activities of a similar nature. The Independent Reporter has not had access to any of the Regions' cost repositories and so is unable to comment how/when the historic costs held were normalised, or whether they suffer the same limitations as described elsewhere.

e. Using the data, the Region would uplift with inflation if required and apply any recognised local and/or project specific complexities (the 'abnormals').

Recommendation
Cost Plan templates, including RMM summary sheets, to provide a high-level collation and summary distinguishing abnormal costs from core costs if normalisation is to be implemented
Exit Criteria
Revised Cost Plan templates and normalisation procedure implemented

5.8 Cost Planning Outputs

a. It is a requirement, under NR's mandated procedures that:

> [a] "Cost Plan shall be supported by a detailed Cost Plan Report providing all narrative, checks, balances, cost analysis and **benchmarking** to demonstrate that the Cost Plan aligns with the Scope and Requirements document. The basis of the Cost Plan shall be clearly referenced to the Client Remit, Sponsors Instruction, Requirements Documents, Engineering Specifications, Designs and Programme. The Cost Plan Report shall clearly reference all documents used for the measurement of quantities."

b. Therefore the purpose of including benchmarking information within the cost plan report is to demonstrate to the Business that the activities within the cost plan are of a similar price to comparable projects, or to highlight that there is a +/- variance to comparable projects and to provide the reason(s), because when an NR Region produces a cost plan it is not a traditional estimate to win the work in the same way that a contractor's estimate would. As attested by the cost plan report, when NR's cost plan is placed alongside tenders received in a competitive process, assuming a standard distribution curve, NR's estimate should be approximately in the middle of the pack if it has been drafted using appropriate historic data and local knowledge.

c. In order for benchmarking to have any validity, the data offered up for it must be normalised so that it can be used, considered and compared on a like-for-like basis. In many respects the Regions implement aspects of normalisation as standard practice, for instance all Cost Plans and reports are produced to a Base Date. All unit rates and Benchmarking figures are all aligned to this Base Date therefore normalising the Cost Plan.

d. In line with the mandated requirement, the cost plan report needs to highlight the normalised data drawn from previous historic projects that has been consulted and to identify what 'abnormal' costs may have been incorporated due to the project's local and/or specific complexities. Returning to the hypothetical example, the narrative would explain that a particular element was showing higher than the benchmark due to a project specific complexity, and should refer the reader to where it displays the itemised cost of the element and that of the abnormal element, in RMM format. As demonstrated in Fig 3, the Unit Rate Overview shows the individual abnormal cost item. It does not however collate, summarise and separate 'clean' direct core costs from abnormals.

5.9 Benchmarking of Cost Plans

a. Within NR's mandated procedures, it is prescribed that:

> "Benchmarking is the process of comparing Network Rail's business processes and performance metrics against best practices from within the company, the railway industry, and / or other industries. Benchmarking of a project will include, but not be limited to, the following comparisons:
>
> - The comparison against Project Anticipated Final Costs of similar projects.
> - Indirect Construction Cost against Direct Construction Cost.
> - Project Management Cost against the Base Construction Cost +Design + Other Project Costs.
> - Design against the Base Construction Cost.

- Risk Allowance against the Base Cost Plan.
- The Group Element / Element distribution of cost – particularly important for a portfolio of similar projects.
- Costs of specific elements of work against standard cost limits, e.g. Signalling Equivalent Unit derived rate, compared on the Efficiency Scorecard.
- Reference Class Forecasting.
- Best In Class Unit Rates"

As can be determined from the above, the procedure mandated seeks to not only draw on normalised data from within the Regions' own cost repository as a means of establishing value for money when seeking funding approval based on a projected AFC (Anticipated Final Cost), but also to use it as a second line of defence to compare business processes and performance metrics against best practices from within the company, the railway industry, and / or other industries when the project is live and in its delivery phase. It does not however explicitly instruct normalisation nor require abnormal costs to be removed when evaluating.

Recommendation
Revise "Cost Planning Procedure with Regional Document referencing" to make explicit requirement for normalisation
Exit Criteria
Revise procedure document to implement normalisation procedure

5.10 CAF Process

a. NR has a requirement to benchmark costs at the end of a project and prior to Devolution in 2019, this had been administered under NR's Cost Analysis Framework ("CAF") procedure.

b. The Independent Reporter was made aware that BenchSmart, the cost planning tool, was mandated with effect from April 2024, and BenchSmart will be discussed in greater detail later at para 5.11 of this document.

c. Prior to the BenchSmart mandate, between Devolution and up until April 2024 (date of BenchSmart roll-out) it was at each Regions' own discretion as to how they captured and benchmarked their project cost data. Broadly speaking, the Regions followed the existing CAF process, adapting and finessing to suit their own purposes and needs based around their own local cost drivers.

d. The key points in the project lifecycle where cost is captured within the CAF process are named as:
   - On completion of a cost plan and/or during a tender event where each submitted tender is analysed
   - At the award of a contract
   - When the final account for a contract is agreed.

e. Further, the prescribed CAF cost capture form instructs the capture of data in the structure stipulated in the Rail Method of Measurement (RMM), thus ensuring the same standardised core cost components are used and can be compared on a like for like basis. Figure 12 below depicts the flow from RMM Estimate through to Benchmarking and the appropriate key milestones (Estimate, contract award and project close out).

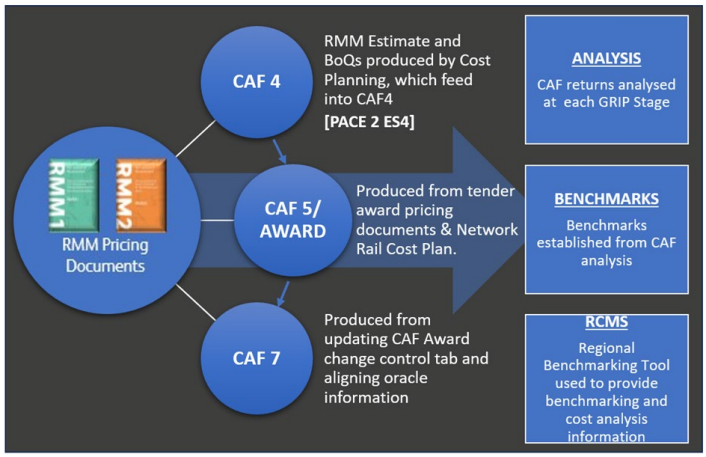

Figure 12: Infographic depicting the flow from RMM Estimate through to Benchmarking and the appropriate key milestones [Source: Network Rail]

f. It is evident to the Independent Reporter that the advantage of the process depicted in Fig. 12 above is that it creates a constantly updating dataset based on best intelligence available at the time in a standardised format common across the entire NR organisation because it has be composed using the standardised RMM definition of core cost component for an activity, and the benefits are as depicted in Fig. 13 below.

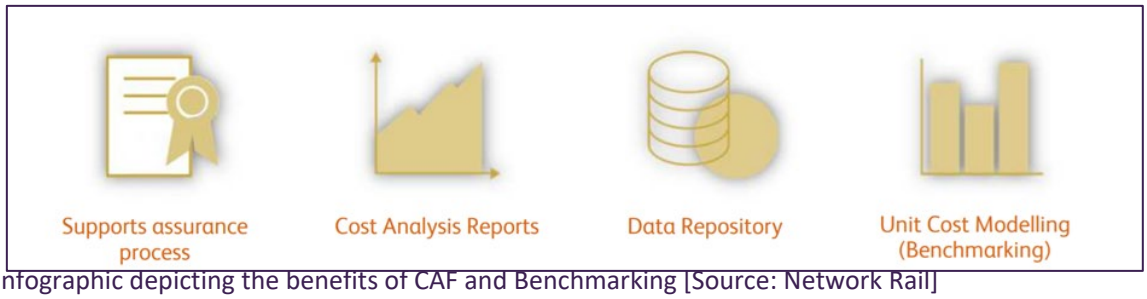

Figure 13: Infographic depicting the benefits of CAF and Benchmarking [Source: Network Rail]

5.11 BenchSmart

a. NR has introduced BenchSmart as a national cost planning and benchmarking tool that standardises how project costs are built, captured and compared across its five devolved Regions for Enhancement and Renewal projects (although, as per the Key Questions instructing this assignment, Renewals were the focus of this Report). It became mandated as the required tool across the entire organisation with effect from April 2024. Originally mandated for new projects with an AFC greater than £2million, the Regions reported that they have regularly been submitting datasets below the £2million threshold as they see the value in capturing lower value renewals work.

b. Using a templated cost stack aligned to the RMM, BenchSmart provides a common language and consistent rules of measurement, enabling cost plans to be structured around standardised core direct cost activities from contract award to final account. Cost data is uploaded at the same key project milestones as previously identified under the CAF process to create a robust national dataset, enabling like-for-like unit rate comparison, improved benchmarking insight and more informed decision-making across the project, programme and enterprise lifecycle.

c. With regard to the £2million threshold, as mentioned above there have been datasets below the threshold uploaded in order to build up a substantial robust database. The Independent Reporter queried what would the consequences be should one Region enter significantly more datasets than others; would that unintentionally skew the unit rate median value in that Region's favour? The Independent Reporter was advised that this was not a cause for concern because when using BenchSmart for pricing cost plans, the Region in the first instance would filter their search for their Region only, so as to take account of their own regionally specific cost drivers.

d. Also, the Independent Reporter found it was not a useful metric simply comparing the number of projects each Region has uploaded to BenchSmart since April 2024. The Independent Reporter found that numbers may vary between Regions, but that is not any reflection on any Region's approach or uptake of the new tool because a

Region may be undertaking a programme of numerous repetitive low-value fast turnaround renewal schemes whereas a neighbouring Region may be engaged in very high value, long duration infrastructure renewals that are several years in development and delivery.

e. It is anticipated that the real beneficial advantages of BenchSmart will be evident in FP1 [Funding Period 1, April 2029 to March 2034; formerly referred to as CP8] once the datasets for projects commencing after April 2024 begin to be uploaded.

5.12 BenchSmart & RMM: A Joined-Up Process

a. NR is, at the date of this report, approximately midway through Control Period 7 (CP7). Devolution to the five Regions during this time has seen the introduction of differing commercial and procurement approaches across towards cost planning.

b. The principal benefit of BenchSmart is that it is intended to overcome this apparent inconsistency of approach and is intended to reunify the cost planning and benchmarking process for NR nationally by instigating a templated tool that uses the common language of the RMM volumes 1 and 2. The resultant effect would be that from the inception of a project; the use of a common method of measurement and quantification (RMM) would lead to an itemised cost plan of standardised core direct cost activities. These standardised costs would be uploaded into BenchSmart as a dataset, again at contract award and then again at final account.

c. By using the common language of RMM, users can then search BenchSmart for like-for-like historic data for pricing and benchmarking, and a feature of BenchSmart is that takes its data and can deflate or escalate Inflation in order to create an equalised pricing point in terms of both date and deliverable.

5.13 Normalisation Throughout The Project Lifecycle

a. As can be seen from the above, by mandating a policy, by using RMM as the method of measurement and by adopting BenchSmart as its tool, NR aspires to normalise its costs and activities at every stage of the project life cycle. However, as previously noted, normalisation is not specifically named as a process and not explicitly accommodated in the cradle-to-grave lifecycle.

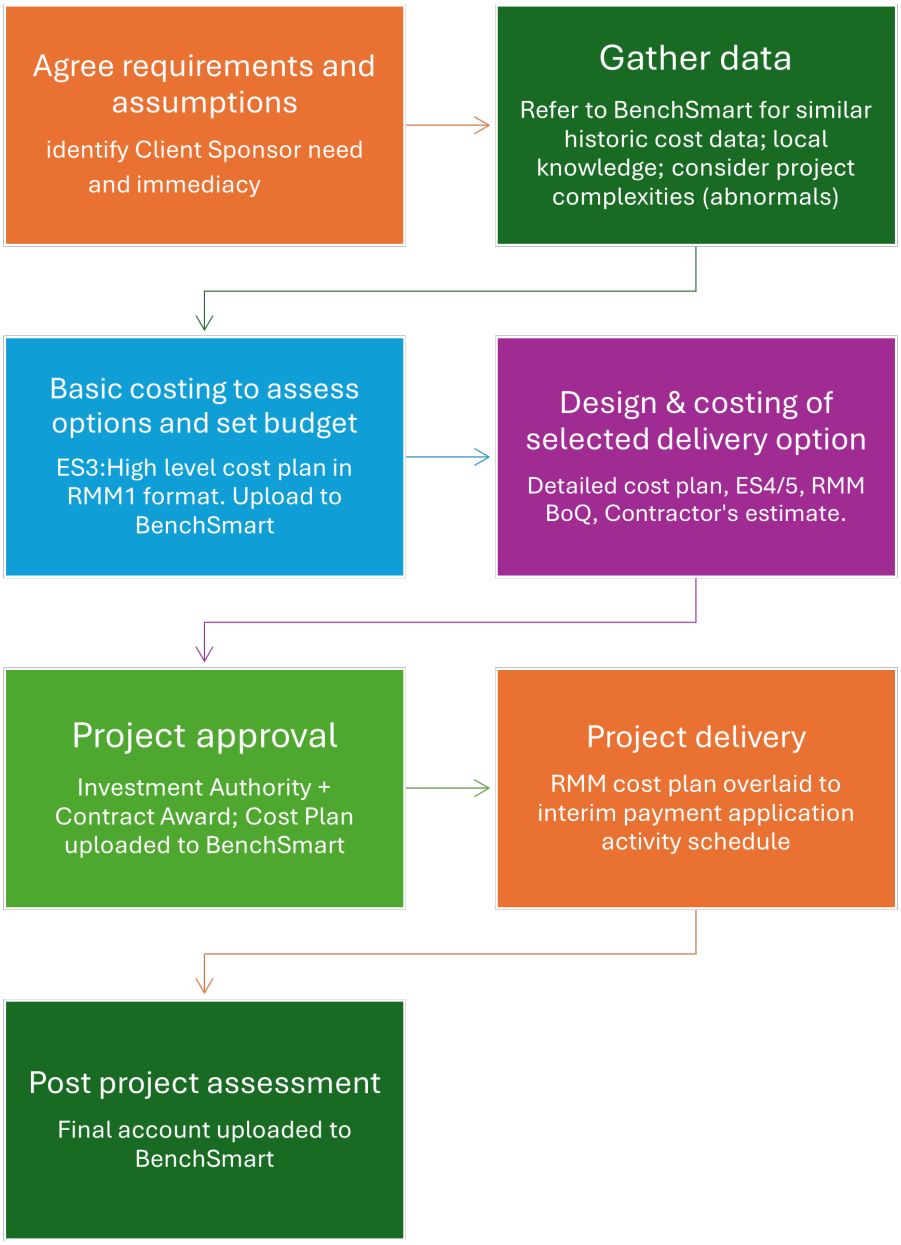

Figure 14: Flow chart showing sequentially the cradle to grave lifecycle of a project [Source: Currie + Brown]

6. Findings

This section presents the Independent Reporter's key findings from interviews and analysis, assessing how Network Rail'Regions apply cost capture, standardisation, and normalisation processes in practice. It highlights strengths such as adherence to mandated frameworks and the benefits of tools like RMM and BenchSmart, while identifying inconsistencies, supply chain compliance issues, and gaps in explicitly achieving full cost normalisation.

6.1 Interviews

a. Representatives from all of the five Regions were generous with their time in attending interviews with the Independent Reporter to demonstrate their current processes and procedures in practice.

6.2 Key Questions

a. The Key Questions raised by the ORR have been addressed below, using both the process and policy information described in Section 5, and with consideration to the findings of interview sessions with each of the five regions, with a summary provided at the end of this section (and carried forward into the Executive Summary).

6.3 Findings

a. From the previous pages, it can be determined that there exists the intent for an entire end-to-end process to standardise cost data at all key milestones in the project lifecycle, although one must bear in mind the relative newness of BenchSmart and counterbalance the volume of information being uploaded against Regions which may be engaged in very high value, long duration schemes that started before 2024 and will be several years in delivery. Nonetheless, given BenchSmart's relative newness the Regions demonstrated their own bespoke systems to capture, benchmark and display unit costs derived from their own approach to the CAF process during CP7, and prior.

b. All five Regions confirmed that the mandated processes are being followed. NR's process clearly sets out the level of sophistication and detail required from a cost plan, set against the project's status in the PACE lifecycle, meaning that the status and cost plan type are all measured and determined by the same metric across the regions.

c. However, NR's ongoing Devolution under CP7 has resulted in differing approaches to commercial management and contracting; including project cost capture, cost planning and estimating. While regional autonomy aims to drive innovation, local accountability, and improved outcomes, it has also created variability in how contract performance is measured and managed.

RMM

d. NR Governance states that the RMM (Railway Method of Measurement) is the organisation's selected means for identifying, describing, defining works when cost planning.

e. The RMM is designed to ensure consistent cost planning, measurement, and valuation across rail projects. NR uses the two volumes:

- RMM1 – Cost Planning & Measurement of Rail Infrastructure Works
- RMM2 – Standard Rail Activity Cost Models

f. Both documents sit within the same suite of documents but serve different purposes during the lifecycle of a rail project.

g. RMM1 provides the rules, classifications, and structure for measuring the physical scope of rail infrastructure works. It is the base measurement standard and used for producing cost plans and estimates when the scope and/or design is at an immature stage (PACE ES3/4).

h. RMM2 contains standard rail activity cost models ("RACM"). Instead of defining how to measure assets, it provides typical productivity, activity definitions, and cost breakdowns for recurring rail construction activities. It provides activity-based cost modelling; productivity benchmarking and detailed estimating when the project has sufficiently detailed design, (PACE ES5).

i. In summary, the RMM 1 describes what is being measured (for example, 200m of platform) whereas RMM2 determines what it costs based on Rail Activity-based Cost Models ("RACM"). So, they complement each other insofar as RMM1 identifies the deliverable based on scope and quantities, and RMM2 applies a cost to that deliverable using RACM.

j. The Regions showed the Independent Reporter real-life examples of a project's cost planning documents drafted from its earliest stages in RMM 1, through to RMM 2 and how it ensures consistency across projects and across regions, and supports like-for-like comparison. Such uniformity offers many benefits in terms of understanding pricing principles as to what is and is not incorporated within the unit cost making tender reconciliation and benchmarking easier and aids towards dispute avoidance.

k. Cost and pricing data standardisation does not automatically result in normalisation. In the absence of a specific standard setting out normalisation objectives, the current process is to specify, measure and value the activities under the respective RMM sections and then to group them together as an asset family. The Regions showed evidence of individual project specific complexities being identified as 'Non RACM' abnormalities which enables it to be separated from the direct core construction cost, but no evidence of a single high-level statement to summarise core cost vs abnormal cost not provided to the Independent Reporter however at present there is no requirement to produce that exercise.

l. It was noted that some Regions have supply chains that are more proactive in utilising the RMM than others. Those suppliers that are conversant with the RMM submit detailed, comprehensive pricing information in RMM format at a detail level appropriate for the cost plan stage. This creates ease of tender reconciliation enabling clear and transparent assessment of competing bids and permits the Region to upload the preferred bid directly into its own NR documents and records. These in turn are inputted to BenchSmart, which creates a seamless flow of standardised, defined cost information from cradle-to-grave.

m. Other Regions with supply chains less engaged with RMM, whether because of unfamiliarity, incompatibility with their own estimating systems, or general behaviours, would find reconciliation of tenders very difficult and a lack of information in the appropriate format would make normalisation of costs difficult if it cannot be determined what was included within the All-In Rate.

n. The purpose of the RMM is to set out in plain English a clear set of defined classifications and components to enable measurement, valuation and financial analysis of railway projects whereby it is clear beyond any doubt what the deliverable item is with all of its component parts, tasks and elements named and identified. This standardised uniform approach is intended to lead to transparency in pricing, benchmarking and in the avoidance of dispute.

o. The RMM has been NR's selected method of measurement for over a decade, and it has been cascaded to its supply chain and stakeholders, and in some cases compliance with RMM is a KPI (key performance indicator) measured against its framework. Consequently, all tender returns from contractors are expected to be in RMM format.

p. However, despite the requirement that it be adhered to, when the supply chain fails to comply it disrupts the cost planning process and hinders comparison.

q. The Independent Reporter was advised of regular non-compliant tender returns in which, despite preparing detailed bills of quantities in RMM format, contractors are failing to price in accordance. For instance, the category of work may be, say, 'Embankment' and below that are, say, 14no sub-categories of specific activities comprising and required for the Embankment – each sub-category being a standardised, clearly defined descriptor that would be uploaded into BenchSmart as part of the normalisation process. However instead of providing a price against each sub-category activity line, some contractors would place an all-inclusive lump-sum against 'Embankment' as the category head and then write 'Included' against each of the sub-categories. This behaviour is not in compliance with the RMM and makes reconciling competing tenders difficult, as well as assessing interim payments and valuing change. It also demonstrates a breakdown in the normalisation process.

Recommendation
Compliance with RMM is a mandate to NR's supply chain, and a measurable KPI. NR needs to remind its supply chain that it must be adhered to (and perhaps offer workshops or masterclass for those unfamiliar or requiring a refresher). KPIs should be enforced against repeat offenders
Exit Criteria
RMM compliance is adhered to by Supply Chain in estimates, tender returns and final accounts.

BenchSmart

r. NR has seen the further Devolution of regional structures and the introduction of differing commercial and procurement approaches across the five regions. While Devolution is intended to drive innovation, responsiveness, and efficiency, it also presents challenges to achieving consistent contract management performance and value-for-money outcomes across the enterprise. Devolution removed the central cost planning function, and delegated responsibility to the five regions to administer the cost planning process in line with mandated processes. From interviews, it would appear that the different regions have taken different approaches to administering the cost planning processes, with varying successes and difficulties.

s. The nationwide adoption of BenchSmart will be a successful solution to standardising cost information to the benefit of the entire NR organisation, with cost datasets being uploaded at the same mandated key milestones. The constant uploading of projects will populate BenchSmart as a powerful cost planning and verification tool, informed by data prepared in the same like-for-like format, thus identifying benchmarks, norms and trends.

t. Further, a functionality of BenchSmart is to render all data to the same date by deflating or escalating the effect of inflation accordingly enabling similar scope activities from different financial years to be considered side-by-side. However, for successful normalisation the unit cost requires stripping away the abnormal cost from the direct core construction cost; the filtering available using the 'Benchsmart Unit Rate Overview' tab can identify the Non-RACM project specific abnormal cost item which assists in the normalisation.

u. As a concept, CFO developed BenchSmart in full collaboration with all five Regions. BenchSmart was developed as a national cost planning and benchmarking tool that standardises how project costs are built, captured and compared across the five Regions. Using a templated cost stack aligned to the RMM, BenchSmart provides a common language and consistent rules of measurement, enabling cost plans to be structured around standardised core direct cost activities from first estimate to final account. Cost data is uploaded at key project milestones to create a robust national dataset, enabling like-for-like unit rate comparison, improved benchmarking insight and more informed decision-making across the project, programme and enterprise.

v. Use of BenchSmart was mandated with effect from April 2024 for new renewal and enhancement projects greater than £2million, however Regions have regularly been submitting project datasets below the £2million threshold and/or targeted specific historic programmes prior to 2024 (such as Access for All schemes) as they see the value in capturing lower value renewals work in order to build up a robust, wide-ranging database to draw from.

w. During the period between Devolution in 2019 and the April 2024 BenchSmart introduction, the Regions developed and used their own tools and systems for cost planning and reporting, and continue using these whilst feeding data into BenchSmart at the same time.

BenchSmart and RMM: A Joined Up Approach?

x. In addition to the above, even when administered fully and properly some anomalies were found with RMM.

y. One such being that RMM, when used properly, leads to detailed bills of quantities however it does not overlay precisely to NR's leading chosen standard form of contract; the NEC4.

z. The NEC4 is a popular and widespread form of contract across the construction and engineering industry because it is written in plain, clear English to reduce ambiguity with the respective duties and obligations of the contract parties clearly defined.

aa. The NEC4 lends itself to rail programmes because its provisions such as early warning mechanisms, risk and change management, programme management and promotion of collaborative behaviours all contribute towards a proactive contractual partnership that suits the safety critical rail environment.

bb. The NEC4 offers a suite of many different options allowing clients to select models most suitable to their needs. Options A and C are often favoured by NR, both of which use Activity Schedules to build up the contract value and also as a reference tool for assessing interim applications for payment.

cc. Whilst not impossible, it remains nonetheless a time-consuming task to overlay the RMM bills of quantities over an NEC activity schedule for interim payment purposes, and then at final account stage to unpick it and reassign to RMM format for inputting to CAF and/or BenchSmart.

Recommendation
It is recommended NR seek to include 'Submission of Final Account Statement in RMM Format' as a milestone from the first iteration of the contractor's (NEC4) clause 31 programme. By doing so it places a clear and unambiguous obligation on the contractor that the contract cannot be deemed completed until it has fulfilled this contractual requirement
Exit Criteria
RMM compatible final account statement received from Contractor that can be used for direct upload to BenchSmart

dd. Notwithstanding the above, correct usage of RMM2 allows for the creation of RACM (Rail Activity Cost Models) for benchmarking, with strict rules on inclusions / exclusions and the selection of 'NON-RACM' items. This should ensure that any abnormal costs are not rolled-up into the benchmarked Cost Model (RACM). The cradle-to-grave CAF process (utilising a combined Pricing Document/Change Register/CAF) should allow cost to be assessed on its own merits and normalised as required.

ee. As mentioned above, Regions have been maintaining their own cost planning systems in parallel to BenchSmart, and those systems incorporate various filters, sliders and the like to view 'like for like' data enabling easy analysis and comparison.

7. Conclusion:

In this section the Independent Reporter concludes that Network Rail's cost capture and benchmarking processes are robust and generally adhered to, but there is no explicit requirement to clearly separate and report normalised versus abnormal costs.

7.1 Key Questions

a. The Key Questions asked of this report were:

   i. Are the processes for capturing project cost information through project life to use for normalisation, and on completion / at close, effective for normalisation activities? In particular:

      - When and how is project cost data including realised risk (be that positive (opportunity) or negative (threat)) normalised for processing?
      - How are the limitations of historic data (including provenance) taken into account when used to predict future costs (e.g. error bands)?

   ii. Are processes for capturing project cost information being followed and if not, what action is taken?

7.2 General Findings and Observations

a. It is evident that cost plans are being carried out in accordance with RMM, and all NR governance and procedures were followed thereafter and that the cost planning and benchmarking processes flow from end-to-end, offering information that can be analysed and verified.

b. The purpose and intention of RMM 1 is to create a standardised definition and build-up of cost components so that the identical pricing mechanism is used for an activity by all persons across the organisation nationally. RMM 2 offers a benchmarking taxonomy with clear inclusions/exclusions, to enable consistent benchmarking within the region which could allow normalisation to take place and the direct like-for-like comparison of similar activities regardless of location or region.

c. BenchSmart is intended to reunify the cost planning and benchmarking process for NR nationally by instigating a templated common tool. It can escalate and deflate prices to take account of inflation to enable comparisons to be made using the same pricing point, but it would appear only as good as the information inputted into it and so at the dashboard reporting level would be generating All-In rates for supposedly similar activities but all with different project specific required abnormal costs baked-in, requiring filtering and interrogating lower level data held within alternative tabs.

d. There is no written NR standard regarding normalisation instructing the summary separation of clean direct core costs vs abnormals, but it appears that as part of the 'business as usual' cost planning activities through the direction of NR's suite of policy and procedure documents, the Regions when applying the principles of RMM 1, RMM 2, CAF and BenchSmart are producing the data in a format that identifies and isolates project specific abnormal costs and/or Non-RACM items. Whilst identifiable through the appropriate level of filtering, there has been no evidence of generating a normalisation statement.

e. In terms of data normalisation, it was shown that the Regions normalise their data when producing cost plans and estimates insofar as identifying and separating any project specific complexities ('abnormals'). It was also shown that BenchSmart has the capability to normalise and filter cost data at a high level, insofar as it can extract items such as railway possessions, irregular working hours and other project complexities, and inflation can be adjusted on historical data to achieve the same pricing point. Normalisation is available within the BenchSmart from the data contained therein however at present the benchmark graphics remain at overall component level.

f. If NR mandated normalisation as a function within its cost planning and benchmarking processes which required actioning from the inception of a project, this could then enable the information to flow along the existing procedures and processes and be uploaded into BenchSmart solely as a normalised cost with the output of a statement of normalised vs abnormal costs.

g. Taking into consideration the purpose of this review, the Independent Reporter made a number of observations. These are summarised overleaf at section “7.3 Summary of report recommendations”.

7.3 Summary of report recommendations

a. The Independent Reporter makes the following recommendations and it is the Independent Reporter's view that the following priorities are suggested:

- Critical (Do Now) – to increase the likelihood of a successful outcome it is of the greatest importance that the portfolio should act immediately.
- Essential (Do By) – to increase the likelihood of a successful outcome the portfolio should act soon.
- Recommended – the portfolio should benefit from the uptake of this recommendation.

Table 2: Summary of report recommendations

Ref.	Recommendation	Evidence	Report Section	Reporter's Suggested Priority	Exit Criteria
1	It is recommended that NR reminds its Supply Chain that compliance with RMM is mandated policy and a measurable KPI. It is suggested that NR reminds its Supply Chain that the policy must be adhered to (and perhaps offer workshops or masterclass for those unfamiliar or requiring a refresher).	Regions advising that Suppliers fail to properly engage with RMM despite it being mandated to approved tenderers and a measurable KPI against approved supplier frameworks.	6.3 Findings (RMM)	Critical (immediate)	RMM compliance is adhered to by Supply Chain in estimates, tender returns and final accounts.
2	It is recommended that a Cost Plan template distinguishing, summarising and ring-fencing abnormal costs from core costs be introduced if a normalisation policy is to be implemented	RMM "Summary of Costs" is not templated to distinguish abnormal costs from core costs. Without a supporting statement of some description, it would take forensic audit of the detailed estimate to distinguish normals from abnormals. Similarly, PACE ES3 high-level cost plan makes no templated distinction for normalisation and relies entirely on the diligence of the user to manually record that an abnormal cost has been incorporated	5.8 Standardisation of Cost Estimating & 5.9 Level of Detail	Critical	Revised Cost Plan templates and normalisation procedure implemented in preparation for next funding period.

Ref.	Recommendation	Evidence	Report Section	Reporter's Suggested Priority	Exit Criteria
3	It is recommended NR introduce a Normalisation specific mandate if to implement a standardised and uniform approach to normalising cost data.	NR's current policies and standards do not explicitly state that normalisation of costs should take place during benchmarking process.	5.11 Benchmarking of cost	Essential	Revise procedure document to implement normalisation procedure
4	It is recommended NR seek to include 'Submission of Final Account Statement in RMM Format' as a milestone from the first iteration of the contractor's (NEC4) clause 31 programme. By doing so it places a clear and unambiguous obligation on the contractor that the contract cannot be deemed complete until it has fulfilled this contractual requirement	Regions advised that supply chain submits documents that do not comply with RMM leading to difficulties in reconciling data for benchmarking	6.3 Findings (RMM)	Recommended	RMM compatible final account statement received from Contractor that can be used for direct upload to BenchSmart

A

Appendix A: Documents provide by Network Rail for information and reference

Appendix A: Documents

The following documents were provided by Network Rail for review to assist in this report:

- Capital Investment & Delivery Policy.pdf
- Cost Planning Procedure v1.8.pdf
- Crewe North ES3-4 Investment Paper.pdf
- Eastern Risk & Value Management Model April 2025.pdf
- FY26 P10 Renewals Benchmarking Report (ORR Audit - Extract).pdf
- Guidance Note - Contingency calculation for early stage cost guidance v3.0 Signed (4).pdf
- Investment Regulations IR01 v7.4.1.pdf
- Long Term Cost Planning Framework CP7 and CP8 (ORR Audit).pdf
- Long Term Cost Planning Framework Summary.pdf
- Managing Contingency on Capital Investment.pdf
- Network Rail Governance and policies.docx
- PACE Policy (Manage Risk).pdf
- Performance and Productivity Handbook V2.pdf
- QRA Policy.pdf
- Renewals Cost and Volume Handbook v1.4.pdf
- Signalling Equivalent Unit - Work Type Application R6.0 0225 1.pdf
- The Fishbone Reporting Framework V9.pdf

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The Value of Certainty.