Office of Rail and Road

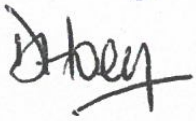
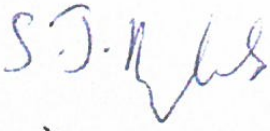
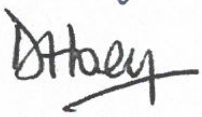
PR18 Efficient Cost Project

Renewals Cost Planning Review

May 2018

IFRA0083

Gleeds Cost Management Ltd.
95 New Cavendish Street, London, W1W 6XF
tel: +44 (0) 20 7631 7000 www.gleeds.com

Prepared by:		Name: Richard Golding	Title:	Associate Director
		Name: Simon Reynolds	Title:	Associate Director
		Name: Derek Hoey	Title:	Associate Director
Checked by:		Name: Richard Golding	Title:	Associate Director
		Name: Simon Reynolds	Title:	Associate Director
		Name: Derek Hoey	Title:	Associate Director
Authorised by:		Name: Mark Syrett	Title:	Director

Revision	Description	Date
0.1	First Draft	18 April 2018
1.0	Final	2 May 2018

Your contact for this project:
Richard Golding
T: +44 (0)20 7631 7160 | **M:** + 44 (0)7767 644450 | **F:** +44 (0)20 7631 7001
95 New Cavendish Street, London, W1W 6XF

Contents

The following Appendices, which include commercially sensitive information, are held separately:

1 Executive Summary

1.0.1 A review has been carried out on the pre-efficient cost plans supporting the December 2017 Network Rail (NR) Strategic Business Plans (SBPs) for Control Period 6 (CP6). The review purpose was to answer the following three questions:

1. Is there a robust process for Cost Planning across NR?
2. Has it been followed?
3. Have the inputs into that process been developed in a robust way?

1.0.2 A sampling basis was adopted, selecting two schemes from each of five asset types (Track, Signalling, Electrification & Plant (E&P), Earthworks and Drainage) on each of six routes (Anglia, London North East and East Midlands, London North West, South East, Wales and Scotland). The sampling criteria were as follows:

- One significant cost scheme, relative to the asset workbank being sampled, in the early years of CP6
- One significant cost scheme, relative to the asset workbank being sampled, in the later years of CP6

1.0.3 The difference in CP6 years was designed to detect any different patterns of scheme maturity although none were subsequently found. The work we undertook on the sample schemes provided us with an insight into the cost planning processes adopted along with their inputs, implementation and outputs. Our review findings do not preclude the existence of evidence we have not seen which might indicate other findings.

1.0.4 The review was carried out on behalf of the Office of Rail and Road (ORR) by Gleeds Cost Management Ltd between January and April 2018 inclusive. A review report has been written comprising:

- A stand-alone main report on the review, findings by asset type, conclusions and recommendations
- Appendices giving details of evidence and audit trails seen by us and detailed observations, meeting notes, Q&A logs and lists of the documents that formed the basis of our review

1.0.5 Our principal findings are as follows:

1.0.6 Track:

- A defined auditable cost planning process, co-ordinated via centre–route liaison, has been applied by each route reviewed.
- The evidence seen suggests that rates and volumes have been developed in a robust way.
- A sufficient “line of sight” from workbank to SBP cost submission has been seen.

1.0.7 Signalling:

- A defined auditable cost planning process provided via the centrally provided Infrastructure Cost Model (ICM) has been applied by each route reviewed.
- The evidence seen suggests that rates and volumes have been developed in a robust way. We have sought to interrogate information provided over the core and add-on rates provenance but the lack of granularity of the data received militated against a meaningful review.
- A sufficient “line of sight” from workbank to SBP cost submission has been seen.

1.0.8 Electrification and Plant:

- Cost planning processes have been evolved locally but guided by the centrally provided "rates book"; they are generally auditable.
- Rates reviewed have been developed in a reasonable way but volume inputs were often not auditable.
- A sufficient "line of sight" from workbank to SBP cost submission has been seen.

1.0.9 Earthworks:

- The cost planning process has a defined national framework supported by the centrally provided "rates book" which has been followed although significant but necessary local variations were found to exist.
- Rates have generally been developed in a robust way except where adjusted because of the poor granularity afforded by the 5 chain length unit of measure. Volumes are not always supported by scoping documents but are guided by the asset engineers.
- A sufficient "line of sight" from workbank to SBP cost submission has been seen.

1.0.10 Drainage:

- Drainage asset management teams have only been established within the last few years.
- The locally driven rates and volume processes used are reasonable and probably as good as can be expected at the current state of asset team development.
- A sufficient "line of sight" from workbank to SBP cost submission has been seen although noting that all routes will need to carry out further surveys and desktop work in support of their workbanks.

1.0.11 Our principal conclusions are as follows:

- Each asset type reviewed has a defined cost planning process which generally uses the "rate x volume = cost" approach. These processes are overall, in our view, sufficiently robust, subject to a realistic assessment of cost uncertainty.
- Track and Signalling are run as national assets with dedicated cost planning and commercial teams. For E&P, Earthworks and Drainage there is a separate commercial team offering support to the routes and there is less central definition of the processes. To some extent this is a reflection of the extent to which asset costs are defined by local considerations.
- Generally inputs have been developed in a robust way.

1.0.12 Actions have been recommended on the basis of concerns identified although these concerns are not sufficient to negate the main conclusions.

1.0.13 The reviewers recommend that:

1.0.14 <u>General</u>

- NR should establish a full snapshot of cost plans and supporting evidence including all post December 2017 updates.
- For Drainage, the ORR review of workbank development processes should consider how workbank volumes are derived and assured.
- For E&P, NR should appraise the statistical basis of cost uncertainty levels in view of the diversity of work types, small sample sizes for some work types and the absence (in some cases) of controlled scope documents covering each renewal scheme.

1.0.15 Route specific

- For London North East and East Midlands, NR should re-evaluate the 33% scope uplift headwind included in the Earthworks pre-efficient rates (which arises from the 5ch length unit measure's lack of granularity so may be realistic), according to a defined method which can be shared with other routes and provide an account of all headwinds transferred into pre-efficient rates.

1.0.16 We further recommend that looking beyond the CP6 SBP submission:

- For Track, ORR and NR should specifically address the impact on the CP6 budget of the track alliance contract strategy and tender negotiations covering all routes.
- For Earthworks, NR should consider replacing the 5ch length unit of measure with another measure that provides the required level of granularity.
- NR to monitor Anglia route's delivery of their workbanks, built around PwC's parametric modelling, for its potential use as a national business improvement tool.
- NR to consider whether the principal of strong central guidance and support demonstrated in the track and signalling asset categories should be extended to the other asset categories.

2 Introduction

2.1 Context

2.1.1 As part of their PR18 (CP6) Regulatory Determination ORR prepared a Statement of Requirements for the PR18 Renewals – Efficient Cost Planning Review. In support of this work, ORR held discussions with Gleeds with regard to undertaking the review of selected asset renewal plans for compliance with Network Rail (NR) cost planning processes. This led to the agreement of a remit, a proposal for the review and a professional services contract.

2.2 Brief

2.2.1 The remit for this piece of work was specifically to answer the following three questions:

1. Is there a robust process for Cost Planning across NR?
2. Has it been followed?
3. Have the inputs into that process been developed in a robust way?

2.2.2 This review was to sample renewals plans in Anglia, London North East and East Midlands (LNE & EM), London North West (LNW), South East, Wales and Scotland routes to test the quality of the inputs and the application of the process in respect of the following asset categories:

- Track
- Signalling
- Electrification & Plant
- Earthworks
- Drainage

2.2.3 The renewals plans reviewed were the versions used to prepare NR's Strategic Business plan published in December 2017.

2.3. About This Report

2.3.1 The main body of this report sets out the rationale, methods, findings, conclusions and recommendations of the review. The detailed observations, analysis and supporting information are in the appendices.

2.3.2 This issue of the report covers all information received by the review team up to and including 24 April 2018.

3 Methodology

3.0.1 Scope and methodology were agreed between ORR and Gleeds during December 2017. During the early stages of this work this methodology was adapted to suit changing circumstances:

- It was found that the NR's current Cost Planning Procedure, issue 3.0, February 2017 was not fully used for CP6 renewals cost planning, but that the lead NR guidance document was the RF6 Business Planning Guidance Version 1.1 03 August 2017.
- Strategic Business Plans and supporting information, originally intended to have been available in December 2017, have been provided over a more extended period spanning December to April 2018.

3.0.2 The purpose of this review being to assess whether a cost planning process exists, whether it has been followed and whether the inputs into that process have been developed in a robust way, our initial identified potential lines of enquiry were as follows:

- Based on the sample of routes and projects, has the cost planning process been fully applied to give a satisfactory outcome?
- If not, what are the risks to the overall estimate?
- Are any risks to the cost plans appropriately flagged and controlled?
- What level of risk is allowed for in Cost Plans and what is this based on?
- Transparency and selection and approval of consistent unit rates in accordance with NR cost planning guidance for pre-efficient estimating purposes and consistency across routes or justification for changes to norms.
- To the extent that the process allows routes to use local data / adjustments, has this process been appropriately followed and justified / assured?
- Cost assurance provided by central estimating team regarding rate data and justifications for variances from norms or, where rates are provided centrally (eg. plain line, ballast) what assurance has been undertaken and by whom?
- Is there evidence of checking/reviewing estimates and associated risks/opportunities?
- Are there any adjustments that ORR should consider making and what are the values of these adjustments? (Fully supported justification for any potential adjustments to be provided).

3.0.3 Our approach to addressing these points was to:

- Review two significant scheme specific renewal plans for each specified asset category (Track, Signalling, Electrification & Plant, Earthworks and Drainage) and for each subject route (Anglia, LNE & EM, LNW, South East, Wales and Scotland) with particular regard to the above points.
- The sampling criteria were as follows:
  - One significant cost scheme, relative to the asset workbank being sampled, in the early years of CP6
  - One significant cost scheme, relative to the asset workbank being sampled, in the later years of CP6
- The difference in CP6 years was designed to detect any different patterns of scheme maturity although none were subsequently found.
- Review the assurance work undertaken by NR on their renewals plans which fed into the Strategic Business Plan for compliance with NR's own assurance procedures.

3.0.4 During initial meetings with the routes it was found that NR central support plays a key role in some areas of cost planning and leading to us undertaking:

- Review of the IP Cost Planning Initial Industry Advice for Control Period 6, Cost Guidance & Unit Rates, December 2016, v2.0
- Review of key inputs from IP Track

- Review of key inputs from IP Signalling

3.0.5 We began by selecting sample schemes on the basis of workbank spreadsheets provided by NR. The sampling was not statistical in nature, but aimed to provide focal points for explanations of rate and volume provenance. ORR communicated the choice of sample schemes to the routes and the review was progressed via meetings at which routes presented their cost planning techniques along with information supporting the sample scheme costs and the overall cost plans.

3.0.6 For the purpose of these meetings we refined the lines of enquiry into the following key questions:

- We would like to see the link between the top numbers shown in the consolidated renewals for GB (the spreadsheet entitled "GB Consolidated – Renewals") excel sheets and the bottom up numbers i.e. how the sheets relate to each other so we can see the thread that links the rates to the overall numbers (the concept of a "line of sight" between the asset workbank totals and the SBP cost submissions)
- How has the scheme been costed? (unit rate, scheme specific estimate etc)
- What evidence is available to support the cost plan? Where have the quantities and rates come from? What adjustments have been made?
- Agree a set of documents for us to take away and review
- What assurance has been undertaken on quantities, rates and scheme complexity?
- Where unit rates have been used, what is their provenance and what does the rate represent (i.e. direct costs only, directs + indirect costs, direct+ indirect costs + risk)?

3.0.7 Supporting information was requested at the meetings and NR key points of contact were established in each route. Subsequent questions from us were addressed via these points of contact.

3.0.8 The review effort was primarily directed towards the unit rates. Rate methodologies were therefore investigated and selected rates were traced to their source. In respect of volumes we aimed to identify whether a reasonable supporting methodology existed. However, bearing in mind that another review team was carrying out a "deep dive" into workbank preparation, this review has placed less emphasis on volumes as agreed with ORR.

3.0.9 Having established that a "rate x volume = cost" approach was predominant across all routes, rather than the scheme cost plan approach initially envisaged, we also modified our approach to risk. Individual scheme risk analyses and the methods for combining these are not relevant considerations in the "rate x volume = cost" planning system. Instead, the risk approach relies on consistency of rate coverage and the methods for overall route/asset level uncertainty assessments. Rate coverage has been addressed by the review and we have noted some of the uncertainty percentage decisions made by routes. However, the basis for NR's route/asset level uncertainty assessments has not been part of the scope of this review.

3.0.10 It is not possible in a review of this kind to apply statistical "robust estimation" methods. We have therefore approached the question of cost plan robustness as follows - a robust cost plan should be reasonably reliable, and not unduly influenced by data points which are likely to be outliers (i.e. not relevant due to factors of scope, coverage, assumptions, optimism, pessimism, complexity etc).

4 Findings

4.0.1 The following findings are derived from the observations and analysis set out in the appendices. The review was not comprehensive in scope, covering only a small sample of schemes within each route's workbank for each asset type reviewed. Thus all findings are on an "evidence as seen/heard" basis, so do not preclude the existence of other evidence which might alter them.

4.0.2 The source of guidance on unit rates for CP6 is set out in "Initial Industry Advice for Control Period 6, Cost Guidance & Unit Rates, December 2016, revised 20 July 2017" - the "rates book". This document outlines the data sets that were analysed to help inform CP6 rates at the following pricing years:

- Signalling 4Q15 pricing
- Track 16/17 pricing
- Earthworks 4Q15 pricing
- E&P 4Q15 pricing

4.0.3 CP6 core rates are therefore based upon projects completed in CP5 uplifted to 17/18 pricing year.

4.0.4 The "rate x volume = cost" methodology generally adopted across the routes reviewed is, theoretically, according to NR cost planning guidance, not conducive to establishing P50 confidence levels. NR guidance suggests that for P50 confidence levels for Pre-GRIP schemes (which the majority of the schemes reviewed were) a 53% addition to the base cost should be added (page 6 of "Cost Planning Procedure, February 2017, Issue 3.0" - CPP). "Base cost" is defined as Direct Construction cost + Indirect costs (Preliminaries and Overhead and Profit) + Design + Project Management + other costs (page 5 of CPP), i.e. it is outturn cost excluding risk.

4.0.5 The "rates book" makes clear what it is providing guidance on - "The Unit rates are "All Inclusive" of Direct Construction, Indirect Construction, Design, Project Management and other Projects Costs and exclude Train Operator Compensation and Risk Allowance" (last paragraph on page 7). This is compatible with actual costs of completed projects where the outturn cost would have included any risks that materialised.

4.1 Track

4.1.1 For conventional track work IP Track have provided a route specific rates advisory service to each route. The extent to which routes have adopted these rates varies but is generally high. Liaison between the routes and the centre, facilitated by IP Track Key Account Managers (KAMs), has resulted in a well tracked evolution of rates, resulting in each route having a rate card agreed with the centre.

4.1.2 The central team has also carried out sense checks, including use of complexity factors to identify comparison projects for workbank schemes, to confirm that the overall cost plan is of the right order.

4.1.3 The central team does not provide volumes. These are provided by the routes. Also the central team does not have involvement in uncertainty assessments which are done by the routes.

4.1.4 For High Output (HO) track work the central HO team has liaised with the routes to produce a CP6 workplan which optimises machine and personnel utilisation, giving a level workload and retaining capacity for anticipated CP7 workload increases. The central HO team has then allocated its resource costs across this plane, giving a set of route specific forecast rates. These pre-efficient route specific rates are considered by the HO team to be post-efficient as well, being based on an essentially fixed resource pool.

4.1.5 Factors which might affect the overall pre-efficient track cost include:

- Recent contracting strategy changes (three track alliances rather than two as assumed for the SBP).
- Ongoing negotiation by routes of the HO workplan.
- Workplan changes due to enhancements, in particular for HO.
- Better / worse access than that in CP5.

4.1.6 Based on the limited level of review carried out the above factors do not indicate a clear direction for likely change of the overall pre-efficient track cost.

4.1.7 Factors which might affect the pre-efficient track costs for individual routes include:

- The central team believe that LNE & EM conventional track work rates are lower than they anticipated and will be challenging to achieve.
- Varying levels of plain line non-delivery are allowed for. Typically a 10% shortfall in work delivered compared to the plan is expected but other percentages are applied by some routes.
- Varying application between routes of headwinds for NR60 Mk2 S&C, under sleeper pads and SCO haulage and material rates for 17/18.

4.1.8 We have not identified any factors common across the routes reviewed which might affect the overall pre-efficient cost.

4.1.9 Factors giving confidence in the overall pre-efficient track cost plans include:

- Rate data validation
- Rate comparison with past works
- Co-ordination between routes and the centre on rates and the HO workplan. The rate development systems for both conventional and HO track renewals enable routes to benefit from central co-ordination and sharing of data and common formats while giving routes the ability to challenge the validity of rate specific methods, data and underlying assumptions.

4.1.10 Factors which might reduce confidence in the overall pre-efficient track cost plans include:

- Only one year from CP5, namely 16/17, is considered by IP Track to provide suitable data, representing the efficiency levels and workbank stability which IP Track considered achievable.
- The pricing of new alliance contracts yet to be tendered may affect costs

4.1.11 Costs are presented in accordance with the CP5 Yr 5 baseline criterion.

4.1.12 A well defined cost planning process therefore does exist, co-ordinated via the centre–route liaison and the centralised HO workplan. The evidence we have seen suggests that this process is robust.

4.1.13 The process has generally been followed by the routes. Some routes diverge on limited aspects as noted above but these exceptions are visible to other routes and to the central team.

4.1.14 A clear “line of sight” from workbank to SBP cost has been seen for each of the six routes reviewed, noting that LNE & EM use a judgement of aggregate volume estimates based on their workbank rather than the detailed workbank total volumes themselves.

4.1.15 The evidence seen suggests that rates and volumes have been developed in a robust way.

4.2 Signalling

4.2.1 A core unit rate for signalling equivalent units (SEUs) is provided by the central team based upon schemes completed in CP5.

4.2.2 The core unit rate in the IIA (December 2016) for CP6 was £261.01k (4Q15 pricing). This was updated in July 2017 to £330k (2017/18 pricing) for RF6 to include inflation and a redefined scope.

4.2.3 Incremental costs ("add-ons") are identified for "abnormals" and "optional extras". The core, abnormals and optional extras rates were peer reviewed by commercial teams within IP regions then briefed to the routes. These rates are embedded in the Infrastructure Cost Model (ICM) provided by the central team.

4.2.4 The routes have adapted the ICM by inserting their own route specific core rates, including more add-ons than the central core rate. The routes then "switch off" these add-on items within the ICM to avoid double counting.

4.2.5 The current central core rate £330k/SEU rate is broken down into three main sections:

1. Core: This is the 'old' CP5 SEU works and includes SEU items and the associated items which do not incur a count in their own right
2. New Items: Added to the CP5 SEU for CP6, now always required:
   - Provision of distribution network operator (DNO) Supplies
   - Provision of Signalling Simulators
   - Provision of fixed telecom network (FTN) and fixed telecom network extra (FTN-X)
   - Early Main Contractor Design in Grip 4
3. Miscellaneous signalling funded items: A new inclusion moving items not previously funded by SEU Signalling Route Asset Managers (RAMs) into the SEU rate.

4.2.6 We have not identified any factors common across the six routes which might affect the overall pre-efficient cost.

4.2.7 Factors which might affect the overall pre-efficient cost include:

- Use of potentially inefficient CP4 and CP5 actuals to inform route divergences from the centrally provided core rates

4.2.8 Factors giving confidence in the cost plans include:

- Centralised guidance and co-ordination via the ICM
- Visibility across routes of rates used
- Route specific rate assessments, reports on which are shared across NR

4.2.9 Factors reducing confidence in the cost plans include:

- The reliance of much of the overall cost on a single set of inputs - the £330k core rate and add-ons
- The unseen basis of some elements included in the £330k core rate, for example the £33k miscellaneous abnormals provision
- We have sought to interrogate information provided over the core and add-on rates provenance but the lack of granularity of the data received militated against a meaningful review
- Review time has been expended identifying the application of the rates by the routes

- Route comments to the effect that route specific rates are needed because rates representing current scope mixes cannot be found in the ICM (note however that local rate assessments are a desirable development input for the ICM)

4.2.10 Costs are presented in accordance with the CP5 Yr 5 baseline criterion.

4.2.11 A well defined cost planning process is provided via the ICM. This process relies heavily on a single core rate and single values for add-on items but each of these is based on a national collection of data from 18 of the largest projects completed in CP5.

4.2.12 The ICM based cost planning process has been applied at all of the routes covered by this review.

4.2.13 A clear "line of sight" from workbank to SBP cost has been seen for each of the six routes reviewed.

4.2.14 The evidence seen suggests that rates and volumes have been developed in a robust way.

4.3 Electrification and Plant (E&P)

4.3.1 Much of the E&P cost is developed using locally derived rates or engineering estimates, the national rates being used where routes could not develop better adapted local alternatives. Reasons given for this generally centre around the diverse range of work types and the difficulty of matching local scope and project characteristics with the basis of the national rates. The route teams often also find difficulty in identifying past work on their own routes which is suitable for planned projects.

4.3.2 An example is the overhead line equipment (OLE) structure replacement rate for LNE & EM. This one rate has to cover both cantilever and portal type structures, so is in effect a blended rate which cannot be applied directly to any specific project.

4.3.3 We have not identified any factors common across the six routes which might affect the overall pre-efficient cost.

4.3.4 Factors which might affect the pre-efficient costs for individual routes include:

- Wales and LNW have applied cost uncertainty allowances within their pre-efficient estimates (noting that we believe these allowances to be incorrectly labelled – they appear to us to be contingency sums so may be seen as necessary parts of the P50 pre-efficient costs)

4.3.5 Factors giving confidence in the cost plans include:

- Close co-ordination between estimators and engineers in RAM teams

4.3.6 Factors reducing confidence in the cost plans include:

- A lack of route confidence in national rates leading to reliance on very limited local data
- Direct input of volumes for E&P components into workbanks, often unsupported by scope documents hence lacking an audit trail
- Low staffing levels in some RAM teams (e.g. Wales)

4.3.7 Costs are presented in accordance with the CP5 Yr 5 baseline criterion except that South East state they have not included CP5 Yr 4 and 5 efficiencies in their CP6 pre-efficient cost plan, the cost impact of which has been assessed at £4.4m.

4.3.8 Cost planning processes have been evolved in response to local and temporal concerns and no effective national co-ordination was evidenced other than the centrally provided "rates book". Therefore it is difficult to make an overall assessment on cost plan robustness for this asset type. However, a clear "line of sight" from workbank to SBP cost has been seen for each of the six routes reviewed.

4.3.9 Generally the rates reviewed have been developed in a reasonable way but volume inputs were often not auditable.

4.4 Earthworks

4.4.1 All routes reviewed have used the Powerpack decision support tool as a starting point – this tool has national rates embedded in it. Most routes have replaced the national rates with local rates to reflect local access issues, geology, topography and delivery markets.

4.4.2 The selection and treatment of data used to generate local rates varies between routes:

- Anglia – local rates were derived from a number of sources including benchmark data from Kent Route, IP published rates, Anglia CP5 rates and PwC modelled rates
- LNE & EM – CP5 Yrs 1 to 3 for smaller projects, engineering and deliverer estimates for larger ones
- LNW – CP5 National IP rates, Framework and Local Delivery contractors
- South East - CP5 Yrs 1 to 3
- Wales - local rates were based upon CP5 actuals with work done to remove outliers from the dataset.
- Scotland - CP5 National IP rates, Framework and Local Delivery contractors

4.4.3 Work types have been defined in all routes using the national descriptions of refurbishment, replacement and maintenance. Earthworks assets have also been categorised in all routes using the national categories of embankment, cutting and rock cutting.

4.4.4 Volumes have been input into Powerpack sometimes on the basis of supporting scope documents, sometimes without supporting documents. The unit of measurement is whole 5 chain lengths. This gives poor granularity and the possibility for large rate variations between years as the focus of operations varies (in one year there may be a focus on small projects each shorter than 5 chains giving an apparent low rate per 5 chains, in another year there may be a focus on larger projects spanning several 5 chain lengths resulting in a higher apparent rate).

4.4.5 We have not identified any factors common across the six routes which might affect the overall pre-efficient cost.

4.4.6 Factors which might affect the pre-efficient costs for individual routes include:

- LNE & EM have increased their rates by 33% to allow for the 5 chain length effect. This may be a valid assessment but has not been evidenced to us by calculation.
- LNE & EM have identified that some headwinds have been moved into pre-efficient cost based on a route decision.
- The review of Anglia found adjustments made between workbank and SBP cost submission to avoid the possibility of double counting for drainage works (in both Earthworks and Drainage).

4.4.7 Factors giving confidence in the cost plans include:

- Close involvement of asset engineers in the cost planning process
- Understanding of local factors

- The existence of a common national basis for collation and presentation of workbanks, volumes and costs

4.4.8 Factors reducing confidence in the cost plans include:

- The difficulty of providing meaningful national co-ordination of rates
- The 5 chain length measurement, combined with changes between control periods in the scale of projects undertaken, has resulted in significant rate changes at LNE & EM. This may also be the case for other routes.

4.4.9 Costs are presented in accordance with the CP5 Yr 5 baseline criterion except that South East state they have not included CP5 Yr 4 and 5 efficiencies in their CP6 pre-efficient cost plan the cost impact of which has been assessed at £0.14m.

4.4.10 The cost planning process has a well defined national framework which has been followed but significant local variations are necessary and were found to exist.

4.4.11 A clear "line of sight" from workbank to SBP cost has been seen for each of the six routes reviewed.

4.4.12 The evidence seen suggests that the plans have generally been developed in a robust way except where adjusted because of the poor granularity afforded by the 5 chain length measure. The development of volumes not always supported by scoping documents but guided by the asset engineers, is generally expected to be robust.

4.5 Drainage

4.5.1 The establishment of Drainage as a separate asset category was identified by all routes reviewed as being an innovation sufficiently recent to make reliable definition of rates and volumes difficult. The Drainage RAMs are faced with the problems of extracting historical drainage costs from broader projects where drainage was an ancillary item, reinserting drainage costs into planned combined projects and assessing asset volumes often with limited survey data.

4.5.2 A drainage decision support tool (DDST) is available but not used by all routes. DDST includes unit rates calculated by taking the national average spend in CP4. It is unclear how many of the rates in the DDST have been used by the routes reviewed.

4.5.3 The routes have generally derived rates from CP5 projects which are generally Earthworks led (sometimes Track or Signalling led). Thus the unit of measurement for historical data is often 5 chain lengths. A consequence is that, where rates are presented at a more detailed level of granularity (pipe lengths in metres, numbers of catchpits etc), these are backfitted from the coarser 5 chain length derived costs, i.e. the rates have been disaggregated.

4.5.4 Volumes have been derived from workbanks which are typically immature and may be subject to significant change during the early part of CP6. Note for example that LNE & EM have costed a round number proportion (25%) of their workbank.

4.5.5 We have not identified any factors common across the six routes which might affect the overall pre-efficient cost.

4.5.6 Factors which might affect the pre-efficient costs for individual routes include:

- The review of Anglia found adjustments made between workbank and SBP cost submission to avoid the possibility of double counting for drainage works (in both Drainage and Earthworks).
- In LNW we found knowledge regarding drainage locations and condition to be lacking.

4.5.7 Factors giving confidence in the cost plans include:

- The local ownership of rate calculations

4.5.8 Factors reducing confidence in the cost plans include:

- Variations in approach between routes
- Varying levels of confidence in asset location and condition information
- The 5 chain length measurement used for much of the historical data informing rate selection
- The difficulty of separating drainage costs from projects where drainage is combined with other works
- Recent establishment of Drainage as a separate asset type

4.5.9 Costs are presented in accordance with the CP5 Yr 5 baseline criterion.

4.5.10 The rate and volume processes used are reasonable and probably as good as can be expected at the current state of asset team development in most routes. They are defined locally. The processes are robust in so far as only information which appears realistic has been used but it is difficult to comment on the overall reliability of the cost plans given that the Drainage RAMs are generally working their way up a learning curve.

4.5.11 A sufficient “line of sight” from workbank to SBP cost has been seen for each of the six routes reviewed.

5 Conclusions

5.0.1 The following conclusions are derived from the findings set out in Section 4 so are also predicated on evidence seen/heard. Conclusions are grouped according to the three key questions guiding the review:

- Is there a robust process for Cost Planning?
- Has it been followed?
- Have inputs been developed in a robust way?

5.1 Is there a robust process for Cost Planning?

5.1.1 Each asset type reviewed has a defined cost planning process which generally uses the "rate x volume = cost" approach. These processes are, in our view, sufficiently robust subject to realistic assessment of uncertainty.

5.2 Has it been followed ?

5.2.1 The "rate x volume = cost" approach is being followed generally save for Anglia Route who adopted a parametric modelling of their workbanks which included reflection that an individual scheme cost would comprise three elements as follows:

- Variable costs which reflect the volume of work being delivered
- Project Fixed costs which relate to how many projects are required to deliver the workbank volume
- Asset Fixed costs which relate to a share of the RAM team cost, delivery organisation cost and other overheads all of which do not relate to the number of projects delivered

5.2.2 Track and Signalling are run as national assets with dedicated cost planning and commercial teams. For E&P, Earthworks and Drainage there is a separate commercial team offering support to the routes and there is less central definition of the processes. To some extent this is a reflection of the extent to which asset costs are defined by local considerations.

5.3 Have inputs been developed in a robust way ?

5.3.1 Generally inputs have been developed in a robust way. The following should, however, be noted:

- The remit was to review pre-efficient costs submitted in December 2017 but routes have provided subsequent updates in their audit trails. The costs referred to in this report may in some cases be superseded by later iterations of workbanks.
- Rates have been derived in accordance with the range of methods set out in Section 8.2 of RF6 Business Planning Guidance Version: 1.1, but not in the case of Anglia's parametric estimating of rates.
- Costs are presented in accordance with the CP5 Yr 5 baseline criterion, except that South East state they have not included CP5 Yr 4 and 5 efficiencies in their pre-efficient cost plans for E&P and Earthworks the cost impact of which has been assessed to be an overstatement of the CP5 exit position of £4.54m.
- Track rates are based on a single year of historical data, 16/17.
- Track rates are subject to impending changes in alliance contract structures and prices
- Signalling costs are heavily dependent on a single set of rates.
- E&P rates in some cases lack comparators for assurance purposes.
- Earthworks cost planning is hindered by the 5 chain length measurement unit.
- Drainage volumes are in many cases not auditable.

- We have identified one instance in LNE & EM where headwinds have been included in pre-efficient costs by the routes.
- Information provision to the reviewers was generally later than planned and the ability to provide review information and question responses varied across NR.

6 Recommendations

6.0.1 In considering what recommendations to make we have taken into account that findings from one route or asset type may be relevant to others. Therefore recommendations made in the appendices have been adapted and broadened in scope for the purposes of this section which gives a single source for our recommendations.

6.0.2 Actions have been recommended on the basis of concerns identified although these concerns are not sufficient to negate the conclusions.

6.0.3 The reviewers recommend that:

6.0.4 General

- NR should establish a full snapshot of cost plans and supporting evidence including all post December 2017 updates.
- For Drainage, the ORR review of workbank development processes should consider how workbank volumes are derived and assured.
- For E&P, NR should appraise the statistical basis of cost uncertainty levels in view of the diversity of work types, small sample sizes for some work types and the absence (in some cases) of controlled scope documents covering each renewal scheme.

6.0.5 Route specific

- For London North East and East Midlands, NR should re-evaluate the 33% scope uplift headwind included in the Earthworks pre-efficient rates (which arises from the 5ch length unit measure's lack of granularity so may be realistic), according to a defined method which can be shared with other routes and provide an account of all headwinds transferred into pre-efficient rates.

6.0.6 We further recommend that, looking beyond the CP6 SBP submission:

- For Track, ORR and NR should specifically address the impact on the CP6 budget of the track alliance contract strategy and tender negotiations covering all routes.
- For Earthworks, NR should consider replacing the 5ch length unit of measure with another measure that provides the required level of granularity.
- NR to monitor Anglia route's delivery of their workbanks, built around PwC's parametric modelling, for its potential use as a national business improvement tool.
- NR to consider whether the principal of strong central guidance and support demonstrated in the track and signalling asset categories should be extended to the other asset categories.