Network Rail & Office of Rail Regulation

L1AR001 – Civils Adjustment Mechanism Review

Review of renewal costs and efficiencies used in developing Structures and Earthworks submissions

Report status: Final

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1 Executive Summary

The following report presents the interim findings from our review of Network Rail's CAM submission as per the scope of mandate L1AR001 "Review of renewal costs and efficiencies used in developing Structures and Earthworks submission".

Our role under mandate L1AR001 is to review Network Rail's progress in preparing a robust costing element to the CAM submission (known as progressive assurance) prior to reviewing the CAM submission and supporting evidence.

Following a change in the mandate, our scope has been amended in the short term to focus only on progressive assurance activities. This report summarises the progress made since appointment and our interim findings.

Our findings are based on a four week review of documentation provided by Network Rail in relation to the CAM submission and meetings held with three routes (Western, LNE and Anglia) to understand how centralised processes and systems have been implemented in practice.

1.1 Central guidance and support

Network Rail has evidenced a wide range of supporting processes and tools (Ref. Appendix A) for the production of the CAM submission at route level. This includes key documents for structures and earthworks as follows:

- CAM Guidance;
- Asset Policy;
- Delivery Plan;
- Cost & Volume Measurement Cost Guide;
- Policy on a Page (Structures only);
- Works Banks; and
- Power pack extracts (Earthworks only).

At this interim stage we consider that this information provides a framework for consistent production of the submission by each of the routes.

1.2 Unit rate findings

Unit rates are just one of a range of methods used to calculate the cost of a priced work bank. Our analysis to date, based on information submitted by Network Rail, has identified that unit costs are likely to represent just 44% of the CAM submission. The remaining costs within the CAM submission are comprised of:

Route based assessment – including 1st principle estimates, GRIP Stage 1-2 estimates and historic trends in expenditure; and

Items without a corresponding cost or volume – including major structures, tunnels and hidden shafts.

Both of these categories can be termed “non-unitised” costs.

Based on our review, our understanding of non-unitised costs from mandate A0/34 and the evidence provided the visibility and robustness of these costs is highly variable. Evidence has been provided of good quality bottom-up cost estimates to inform specific Route requirements whilst no evidence has yet been provided to substantiate historic trended cost allowances. This issue was also identified at SBP under mandate A0/34.

Our key findings include:

- The methodology for structures unit rate estimation (Reference section 4.1) has the potential to overestimate project costs. We have identified that the method of calculation appears to favour Network Rail and further evidence is required to support Network Rail’s estimating rationale;
- The difficulty of applying national unit rates to more local programmes of work;
- The subjective adaption of structures unit rates at route level and the processes by which these adaptions are reviewed and agreed;
- The lack of supporting information for non-unitised costs; and
- Visibility of risk across all estimating approaches leading to a lack of programme level risk awareness.

The following table illustrates the approaches adopted by Network Rail and their relative contribution to the CAM submission. As shown, over 50% of the CAM submission will be comprised of non-unitised costs.

Estimating approach	Value (£m)	%
Based on National unit rates	748	44%
Based on Route submissions	685	40%
Data without a corresponding cost model & volume	265	16%
Total	**1,698**	**100%**

Figure 1.0: Estimating approaches used in the CAM submission (Arup)

Based on our review of the National unit rates we did observe good practice in terms of sourcing, analysing and managing data. Data was clearly identifiable and a number of examples were subject to a “walk through” by which the final unit rate for a structure or earthworks intervention was traced back to its source with all adjustments clearly identifiable.

In our opinion, an ideal scenario is the use of contractor’s estimates for the work bank with contractual buy-in to delivery within a budget. However, this represents

a specific procurement route that may not be appropriate for all asset types in all circumstances.

1.3 Efficiency findings

Our review identified that efficiencies are applied to the routes priced "pre-efficient" work bank and are comprised of potential savings against five key themes and twenty one interventions. These are applied at route level but with a high level of engagement with a central co-ordinating team.

Our key findings include:

- The efficiency framework is logical and comprehensive, but route application remains high level without quantification of the efficiencies to be achieved;
- Year one and two efficiency information does not appear to have been factored into future years at this time;
- Limited evidence of specific programmes or projects to deliver efficiencies in practice;
- A very high reliance on third parties, such as the construction supply chain, to deliver efficiencies;
- No performance management regime or management system exists to monitor and evaluate real efficiency; and
- It is not yet possible to provide an opinion on robustness and sustainability given the limited maturity of the proposals.

Of the above, the reliance on third parties with no current incentive to deliver to plan is significant. For example, achieving supply chain efficiencies at 2nd and 3rd tiers is highly dependent on market conditions (which are broadly improving for contractors in 2015/16) and as such a very clear strategy is needed on how these efficiencies are achieved. Without this, the Route will be significantly at risk and need to identify alternative approaches. The understanding of risk associated with each efficiency proposal was found to be low in our discussions with each Route.

Additionally a key area of efficiency gain is related to the ownership of the asset intervention identified in the work bank. At route level we observed that in some cases the Route Asset Manager (RAM) took total ownership of the intervention whilst in others a more flexible approach was taken with Network Rail IP. In some routes for example, IP will be able to recommend and implement cheaper alternatives subject to meeting a basic set of RAM requirements.

Overall, the management and monitoring of efficiencies is an area of concern and in section 9 we have identified a number of improvement measures.

2 Mandate Overview

Arup has been appointed under Mandate L1AR001 to review the costs (unitised and non-unitised) and efficiencies included in Network Rail's CAM Submission. The illustration below sets out the basic framework by which costs and efficiencies are used in the production of the submission for years three to five of the control period.

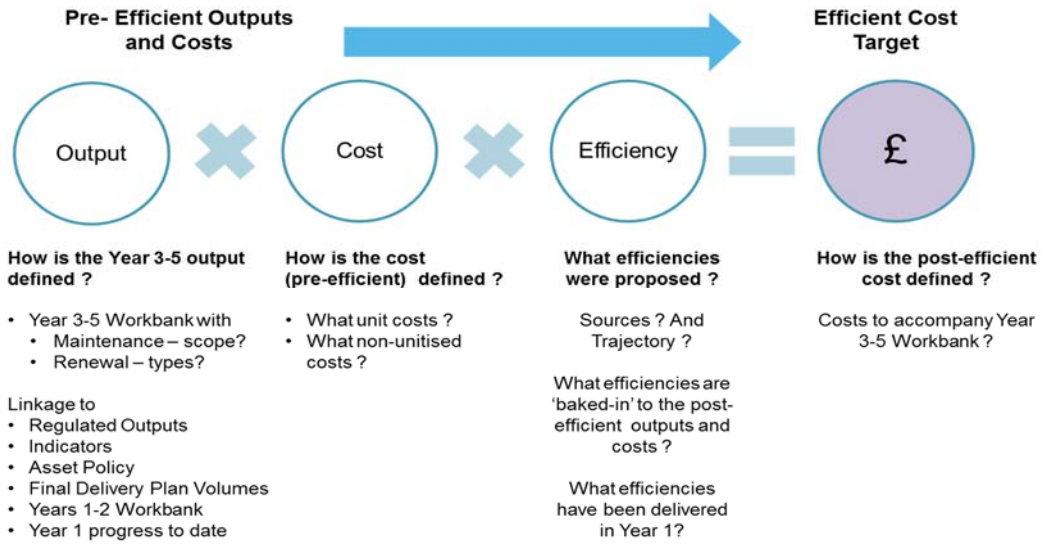


Figure 2.0: Overview of unit costs and efficiencies in production of the CAM submission (Arup).

The key questions posed in the mandate and the subject of our focus include:

- Reviewing the quality of Network Rails revised unit costs;
- Reviewing the quality of Network Rail's non-unitised costs;
- The extent to which the above have been benchmarked against external comparators;
- The resulting degree of uncertainty;
- Quality of efficiency plans for the CAM submission;
- The robustness and evidence for efficiencies achieved or planned to inform years 3, 4 and 5;
- The extent to which efficiencies have been benchmarked against external comparators;
- Whether the efficiency plans are likely to be detrimental to short or long term delivery output; and

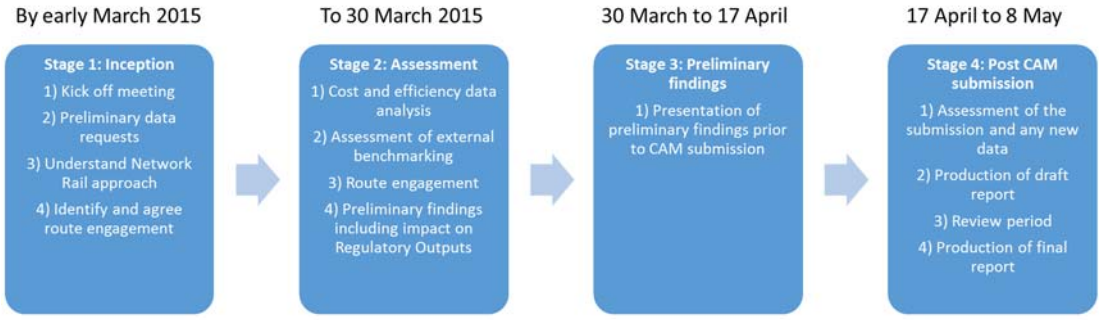
- The extent to which errors or discrepancies identified in mandates AO34 and AO35 have been addressed.

In all cases we have commented on the robustness of costs and efficiencies by discipline, and operating route. Our methodology proposed that up to three routes were engaged to understand how cost data and efficiency measures have been used in production of the CAM submission. We have also consider compliance with the Network Licence, and in particular Licence Condition 1 which requires Network Rail to operate, maintain, renew or replace the network "in accordance with best practice and in a timely, efficient and economical manner".

As the reporter responsible for the production of various mandates during CP4 including A034 and A035 and the review of regulatory accounts over three years we are able to ensure that previous work is not duplicated. Insights gained from those mandates have informed our understanding of the background and development of the CAM, and have helped shape our approach to this assignment.

3 Progress to date

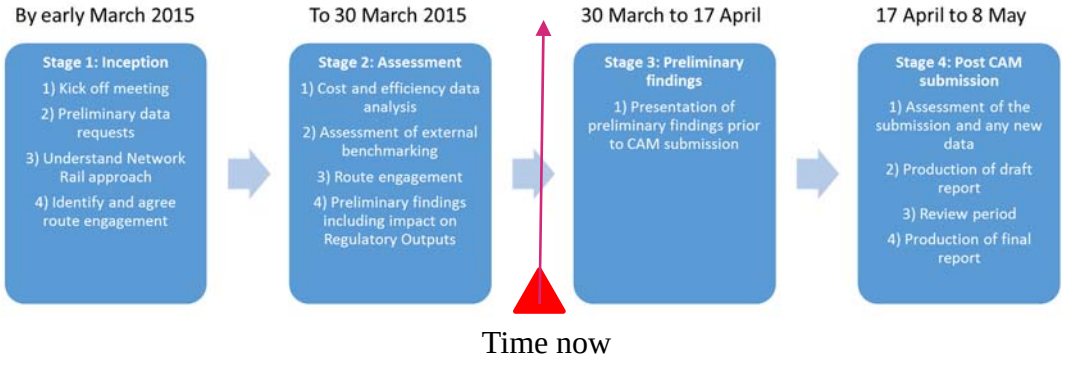
In our response to the L1AR001 mandate we set out the following four stage methodology:



The first stage identified the key people involved in the CAM submission, the work undertaken to date and the overarching Network Rail strategy. At this time we tabled and recorded our first data requests to Network Rail and agreed on the timescales for submission of information. We also confirmed with Network Rail the extent of route engagement and when this would occur.

During Stage 2 we undertook the core analysis for the mandate, reviewing data submissions from Network Rail and undertaking meetings with the Network Rail team to progress any issues identified. Our aim during Stage 2 was to gather sufficient evidence to provide assurance on the CAM submission. A key component of Stage 2 was to undertake route engagement. We visited three routes, (LNE, Anglia and Western) to understand how costs and efficiencies have been implemented in the CAM submission.

Stage 3 was an opportunity to present our preliminary findings in advance of the CAM submission and confirm our focus and work programme for reviewing the CAM submission in Stage 4. Post appointment our mandate has changed to reflect a revised strategy by the ORR and Network Rail.



As agreed our work has halted to allow Network Rail to develop further supporting evidence for the CAM submission. Our analysis has therefore been

halted at the start of Stage 3. Presentation of our preliminary findings took place on the 1st April 2015. This report summarises our initial findings from stages 1 and 2.

In section six we have provided an overview of practical next steps that will support the evaluation of the CAM submission. These may be used to inform the revised mandate when issued.

4 Key Findings

4.1 Unit Costs

4.1.1 Structures – Unit Rates

In advance of the submission Network Rail has provided an overview of a draft forecast (Years 3 to 5) of £1,698m.

The following table summarises the estimating approach adopted for the pre-efficient values presented in the draft CAM submission indicating whether unit rates, route estimates or other methods have been used.

Estimating approach	Value (£m)	%
Based on National unit rates	748	44%
Based on Route submissions	685	40%
Data without a corresponding cost model & volume	265	16%
Total	**1,698**	**100%**

Figure 3.0: Analysis of estimating approaches in the CAM submission (Network Rail)

National unit rates were used in the SBP submission and those presented in the CAM submission are anticipated to reflect progress made in the intervening period in improving their accuracy and reliability.

During stages 1 and 2 of our analysis it was unclear which unit rates are being applied in the CAM submission with routes such as Western stating that their submission uses the same rates as those developed at SBP. This varied in LNE where more recent and up to date unit rates have been applied.

Based on this evidence and our analysis of unit rates under mandate A0/34 we believe Network Rail needs explicit in identifying what unit rates have been used to inform the submission and how any risks in the application of SBP unit rates have been addressed.

4.1.2 Structures – National Unit Rates

Thirty two National unit rates have been used to derive £748m, or 44%, of the estimated value of the CAM submission. Our observations include:

- Network Rail adopts good practice in terms of sourcing, analysing and managing data evidenced by reviewing unit rates back to source data;
- The final benchmarking assumption in this process is very important. Network Rail takes average project unit rates rather than calculating total cost and volume. Our findings are illustrated in Figure 4.0;
- No adjustment has been made for efficiencies realised between 2006 to 2011;
- New data in a CAF (Cost Analysis Framework) "holding account" is yet to be incorporated into the source unit rate data. This may affect the accuracy of some unit rates bt may also reflect more recent and relevant benchmark data;
- No separate risk allowance has been made as risk is assumed to be included within actual costs. A planned risk analysis by Network Rail may change this position;
- Some CAF data is missing (NR management and design costs) and further evidence will be needed to identify where this is included; and
- GRIP stage 1&2 costs are not captured in CAF and are not included in the unit rate for the purposes of the submission. Again, evidence will be required to identify where this is included within the submission.

At this time we have not completed a substantive review/audit of the unit rate data.

As previously stated the final calculation by which Network Rail derives unit costs is a key issue requiring clearer explanation of the estimating rationale. Figure 4.0 below provides an illustration of how three projects actual cost and volume data can be used to present alternative unit costs. We have described these approaches as follows:

- Average unit rate; and
- Overall cost and volume.

Network Rail uses the average unit rate approach. This takes the unit rate for each project and calculates an average rate, in this case £116/m^2. We have identified an alternative approach by which the total costs incurred are divided by total volume resulting in a rate of £56/m^2.

Item	Average unit rate approach	Overall value / overall volume approach
Project 1	Volume = 10m2 ,Value = 2,000, project rate = 200pm2	
Project 2	Volume = 100m2, Value = 10,000, project rate = 100pm2	
Project 3	Volume = 1,000m2, Value = 50,000, project rate = 50pm2	
Total	Volume = 1,110m2,value = 62,000	
Derived rate	(50+100+200)/3 = **116pm2**	62,000 / 1,110m2 = **56pm2**
If played back into the same volume	116pm2 x 1110m2 = **128,760**	56pm2 x 1110m2 = **62,000**

Figure 4.0: Alternative approaches to National unit rate estimation (Arup)

This example shows that the actual unit rate derived is much higher than the sum of the total costs divided by the total volume. Network Rail's approach effectively means that each project, regardless of volume, has an equal weighting and therefore cannot reflect issues of high cost/low volume and low cost/high volume.

In support of this analysis we reviewed five unit rates to understand the variances in the two estimating approaches as follows.

Item	Value of item in submission	%	Method 1: Average unit rate	Method 2: Total cost & volume	Variance
UB preventative metallic	50,094	6.7%	2,051	894	-28,259
UB replace metallic	80,094	10.7%	9,749	6,443	-27,160
UB repair masonry	91,589	12.2%	2,520	561	-71,200
OB strengthen metallic	75,212	10%	4,725	2,368	-37,518
OB strengthen concrete	10,914	1.5%	1,812	1,192	-3,734
Total	**307,903**	**41.1%**			**-167,871**

Figure 5.0: Analysis of intervention unit rates using alternative approaches (Arup)

Based on this analysis we believe Network Rail needs to provide further assurance that the estimating approach is robust and appropriate. Reductions of this order of magnitude are significant and clearer evidence is required the approach is appropriate. Sensitivity analysis are a useful tool to determine the impact of alternative approaches and are recommended.

We have identified similar approaches in other sectors (such as airport terminal benchmarking) however these have not been made in support of a funding application of this scale.

4.1.3 Structures – Route submissions

The second approach to cost estimation in the CAM submission relates to the techniques or processes developed by the routes and accounts for £685m or 40%. Figure 6.0 below provides further detail of the variety of approaches adopted and their contribution to the CAM submission.

Item	Value (£m)	% (of CAM total)
Unspecified	0.76	0%
Historical / Trends	375.0	22%
GRIP 1-2 Estimates	19.6	1%
1st Principle Estimates	289.9	17%
Total	**685**	**40%**

Figure 6.0: Costing approaches adopted by the routes (Arup/Network Rail)

Based on the above items and the evidence gathered we have made the following observations:

Historical trends have not been provided or reviewed at this time and form a significant part of the CAM submission. Further guidance will be required from the ORR in terms of how these costs are analysed and reviewed;

GRIP stage 1 and 2 estimates are a reasonable source of cost information for a project however this raises significant issues in terms of validation as the approach and level of accuracy and reliability will vary both from project to project but also from route to route. However, this should be seen in context as these items account for just 1% of the submission; and

First principle estimates offer a greater level of assurance in terms of reflecting the specific constraints and risks of a particular route based on their geography, access

constraints and local market conditions. Evidence provided (E.g. by Anglia) has been of good quality but is of limited sample size. Again this raises issues in terms of validation as these estimates are commissioned and produced at route level. No evidence has been provided to demonstrate central sampling or review prior to their inclusion in the CAM.

4.1.4 Structures – Data without a corresponding cost model & volume

The second approach to cost estimation in the CAM submission relates to data without a cost model or volume and accounts for £265m or 15.6%. This cost is advised to the centre by the Route and includes a wide range of items including:

- Major structures;
- Tunnels (Part);
- Structures other (E.g. Examinations and investigations);
- Coastal and estuarial defences;
- Culvert (Part);
- Retaining walls (Part); and
- Minor works.

Only preliminary or verbal evidence for this estimating approach has been provided by the Routes at this time. Again, these items are not estimated using unit costs and therefore a different approach to their review must be undertaken.

We recommend that further clarity is obtained in any future mandate with regard to non-unitised costs and how these are to be reviewed for the purposes of the CAM. Non-unitised costs comprise 54% of the total submission and are a key driver in the costs presented by Network Rail.

4.1.5 Earthworks and Drainage – unit rates

The routes visited have provided draftCAM submission values and the unit rates they have used. SBP CP5 values for earthworks in years 3-5 were £381m pre-efficient and £339m post efficient.

Evidence has been seen from route meetings that national earthworks and drainage unit rates are being used to derive costs as follows:

- Western – National unit rates used 100%;
- LNE – National unit rates used 100%; and
- Anglia – National unit rates used plus a 50% uplift

Evidence is required post CAM submission that the above statements are correct.

National earthworks unit rates include a component of drainage (approx. 30%). Drainage works also crosses over assets of track, buildings and earthworks. The National unit rates are unchanged from those presented at SBP and assessed under mandate A0/34. The following key observations were made by Arup and included in our conclusions:

- The unit rate methodology can be traced back to CAF data;
- No new CAF data was incorporated since SBP unit rates were developed;
- A wide range of project unit costs was observed;
- Adjustments were made for efficiencies realised between 2006 to 2012 (different to Structures unit rates);
- A 4.4% central overhead provision was included;
- Small variance in inflation indices used between earthworks and structures as shown in Figure 7.0 below:

Year	Structures inflation	Indicative variance to £100	Earthworks inflation	Indicative variance to £100
		100		100
CP3 – 2007/08	4.36%	104.36	4.37%	104.37
CP3 – 2008/09	-1.23%	103.08	-1.25%	103.07
CP4 – 2009/10	5.07%	108.30	5.12%	108.34
CP4 – 2010/11	5.14%	113.87	5.12%	113.89
CP4 – 2011/12	3.10%	117.40	1.01%	115.04

Figure 7.0: Inflationary variances identified at SBP and reviewed under mandate A0/34 (Arup)

4.2 Efficiencies

4.2.1 Defining efficiency

Our approach in reviewing the efficiency plans presented in the CAM submission has focused on the key components of efficiency in a manner that is consistent with the ORR's definition. The achievement of efficiency requires the following:

- **Reducing costs**; this can take the form of volume reductions, unit cost reductions, non-unitised cost reductions.[1]
- **Positive management actions**; deliberate measures or actions with "real" positive impacts.[2]
- **Robustness and sustainability:**[3]
    - "Robustness" involves making saving without adversely impacting output delivery during CP5.
    - "Sustainability" requires longer-term confirmation that savings can be sustained indefinitely (all things being equal), without any long-term adverse output or cost impacts beyond CP5.

In evaluating the quality of efficiency proposals, we have taken each of the above aspects into consideration, and summarised our findings in the following chapter.

4.2.2 Key findings: CAM efficiency formulation process

Background

Network Rail originally developed a series of proposals for achieving efficiencies in civils asset delivery (encompassing structures, earthworks and drainage) as part of its Strategic Business Plan (SBP) for CP5, published in early 2013.

The development of SBP efficiency proposals during late 2012-early 2013 was a collaborative process involving both central and route based teams. A total of 21 specific efficiency measures and initiatives were proposed in SBP, mapped to five key thematic areas. Network Rail estimated that efficiency savings achieved through these initiatives would enable efficiency savings by 2018/19 (the CP5 "exit year") of 13.8%

The ORR recognised greater efficiency potential than Network Rail for civils asset delivery, and as a result proposed in the PR13 determination an efficiency trajectory of 19.0%.[4]

[1] Efficiency-driven cost reductions within the context of Network Rail's CP5 funding are defined and set out in the ORR's PR13 Determination (October 2013).
[2] Consistent with the ORR's definition set out in the PR13 Determination p.460
[3] Consistent with the ORR's definitions set out in the PR13 Determination p.836
[4] ORR PR13 Determination, p.303

Process overview

The CAM efficiencies formulation process is depicted in the figure below.

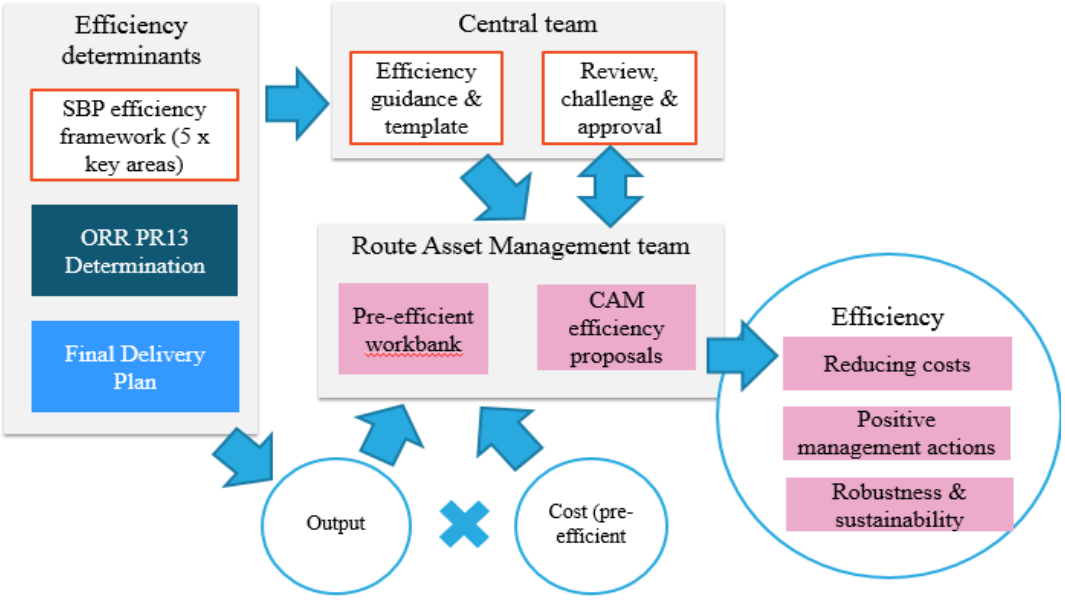


Figure 8.0: CAM efficiencies formulation process[5]

As illustrated above, the central team has developed the guidance and the template for CAM efficiencies, which are applied by the route-level asset management teams to their pre-efficient work bank. The resulting efficiency proposals are subject to review and challenge by the central team, with approved plans feeding into the CAM. We discuss these processes in further detail below.

Adoption of SBP-based efficiencies framework for CAM

To support the re-evaluation of assumptions around costs and efficiencies for the final three years of CP5 within the CAM, Network Rail has set up an efficiencies framework. This is being overseen and monitored by Network Rail's central CAM team however, route asset management teams (RAMs) are responsible for the measure and delivery of these efficiencies.

The CAM efficiencies programme framework is based around the five SBP efficiency themes and associated initiatives below;

[5] Source: Arup analysis

Improved Asset Knowledge	Improved asset information
	Improved monitoring of assets
Business Planning & Collaboration	Optimise working windows
	Improved workbank planning & coordination
	Enhanced decision support tools
	Improved possession management
	More efficient work packaging
	Proactive investigation prior to intervention
Resource Utilisation & Enhanced Capabilities	Enhancing competencies
	Immediate rectification of faults
	Enhanced capability
	Lower cost plant
	Bring design capability in-house for low complexity
Policy Optimisation	Increased choice of delivery organisation for medium complexity work
	Delivering economies of scale
	In-house capabilities to deliver economies of scale
Procurement, Tendering & Contract Management	Enablers for IP efficiencies
	Supplier selection
	Reduce contractor overheads
	Efficient tender designs
	Extended minor works deadlines

Figure9.0: SBP - CAM efficiency initiatives[6]

We consider the SBP initiatives provide a logical and comprehensive framework that can help structure and define CAM efficiencies as a company-wide programme, with common themes and objectives. However, the extent to which this translates into real efficiency improvements will be entirely dependent on how far routes can effectively adopt and put into effect the improvements defined through the framework. At present, implementation remains at a very early stage, as we explore in further detail below.

Efficiencies template and narrative

Network Rail's central team has developed a template that the structures and earthworks RAMs in each route must complete as part of their CAM submissions. The template includes:

- Summary sections setting out total year-on-year efficiency savings expected
- Details of each specific initiative, with expected savings amounts each year together with a narrative describing how these are to be achieved.

[6] Source: Network Rail presentation slides, 13th March 2015: "CAM Efficiency Methodology", p.3

In the six submissions reviewed from the three routes, RAMs have typically selected 10 – 12 initiatives across the five areas.

In addition to the narrative, for each initiative a confidence level can be assigned using a red-amber-green system although not all submissions presented has included this.

In setting the framework, the central team also proposed a distinction to be made between "inclusive" and "exclusive" efficiencies, whereby:

- "Inclusive efficiencies" are fully incorporated within cost rates already encompassed within the CAM proposals; and
- "Exclusive efficiencies" are those measures and efficiencies that are expected to evolve and be achieved in CP5, but are still to be fully defined and quantified, and hence are not yet encompassed in CAM.
- We depict in the chart below the original target efficiency trajectories set out in the SBP (14% by CP5 exit) and the PR13 determination (19%)[7], compared to the CAM submission which, we understand, is targeting an exit rate efficiency of 18.5%, the combined total of inclusive and exclusive efficiencies.

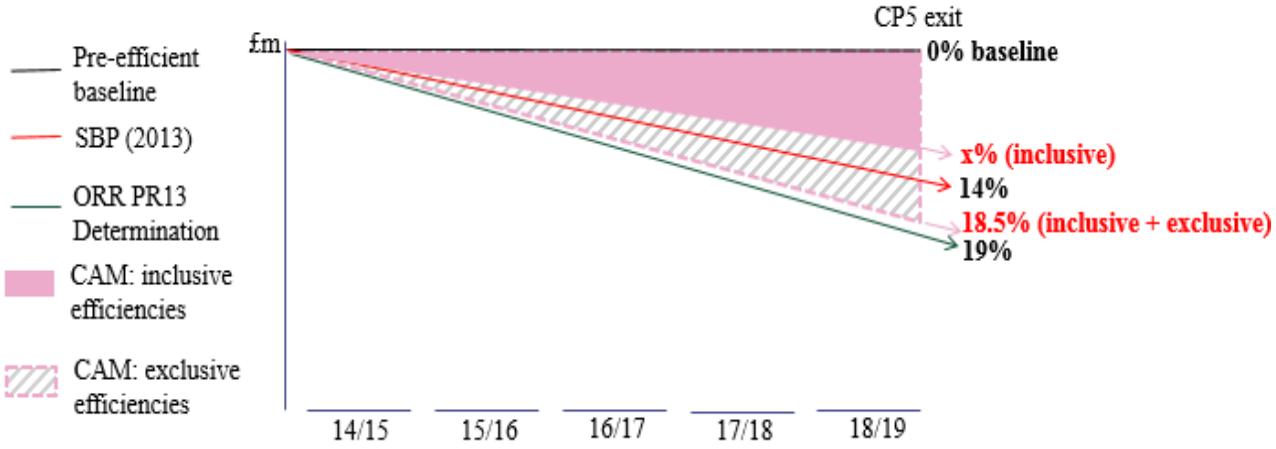


Figure 10: CP5 efficiency savings trajectory for civils asset renewals[8]

In reviewing route submissions, we have found some ambiguity around the distinction between "inclusive" and "exclusive" efficiencies. In some cases, routes used the terminology to distinguish efficiencies that asset management terms had oversight of (inclusive) versus "exclusive" efficiencies that depended on delivery by external contractors.

[7] Target efficiency trajectories for Civils asset Renewals
[8] Source: Arup analysis

Network Rail has acknowledged the need for clarification around the terminology although the distinction is expected to become less important as proposals become embedded in the CAM process going forward.

We consider it essential that all CAM efficiency proposals become fully quantified and embedded as "inclusive" efficiencies within Network Rail's civils programme by the start of 2016/17, when the CAM comes into effect. Network Rail's commitment to deliver a quantum of efficiency savings vs. the pre-efficient baseline position for each of the three years in question will need to be underpinned by fully developed efficiency plans, built up from the initiatives currently identified as both inclusive and exclusive.

Network Rail has indicated that it intends the CAM efficiency submission to be a "live" document that reflects ongoing progress with a narrative that is continually updated and refined to ensure efficiency remains a priority. We consider this a positive indication that Network Rail recognizes the need for ongoing, continual development of CAM efficiencies as a programme of work. However, we consider it is more important that efficiencies development and implementation is given due recognition as a long-term business change programme at route level, where actual delivery of efficiencies will need to take place. We discuss this further in section 4.2.4.

4.2.3 Key findings: reducing costs

Quantifying efficiency-driven cost reductions

As indicated above, a key aspect of efficiency is the reduction of cost. We have assessed the extent to which details in the CAM of how costs are to be reduced have been developed to date by Network Rail.

Quantifying the cost savings resulting from efficiency measures is inherently challenging, and requires robust and consistent data to enable comparisons between pre- and post-efficient costs to be made.

The can be achieved most easily with unit cost data (as discussed earlier in this report). Showing how unit costs have evolved can enable the impact of efficiency measures on a particular type of activity to be demonstrated. It can also enable efficiency savings to be planned and quantified for the particular activity type going forwards.

Another means to show efficiency savings is volume-related information, to evidence reductions in the scope of activities resulting from efficient practice. For civils assets this is likely to be more challenging due to significant year-on-year variability due to the diversity of intervention types, often with significant fluctuations in profile compared to more linear types of rail assets.

Otherwise, even for areas of cost not broken down into activity volumes and unit costs, the impact of efficiency measures can still be quantified if a like for like comparison of costs in the baseline year compared to the actual year is available.

Efficiency quantification and baseline in the CAM

The presentation of cost savings in Network Rail's efficiency proposals indicates that the proposals are in an early stage of development. Incremental year-on-year savings are projected but the figures shown are mainly high-level estimations that RAMs have applied top-down, on the basis of what they judge to be achievable, as opposed to anything built-up and tested on a costed, "bottom-up" basis.

It is not apparent to what extent Network Rail has taken into account Years 1-2 efficiencies within its forward-looking plans. The percentage savings for these years, as with all figures shown, were based on the RAM's judgement and no year 1 actuals were presented or reflected in the profiles and projections – although it was noted that at the time of review, Year 1 was still to conclude.

Although the original SBP expenditure and efficiency proposals entailed a degree of quantified, bottom-up modelling of civils activities in order to quantify a "baseline" expenditure position, Network Rail has stated that the original SBP Years 1-2 baseline is no longer applicable due to the re-formulation of civils plans in the run-up to CAM.

Without a pre-defined baseline expenditure level, Network Rail has indicated that the baseline expenditure values shown in CAM for Years 1 and 2 are back-calculated from the actual expenditure levels, using "assumed" efficiencies, which Network Rail considers it is already in the process of achieving. We have not yet seen any analysis from Network Rail that evidences how actual (Year 1 -2) civils renewal activity is making efficiency savings.

Overall, Network Rail has yet to develop detailed quantified analysis demonstrating how actual or proposed efficiency measures will reduce costs.

Forward-looking efficiency projections

The projected efficiency numbers for Years 3-5 of CP5 (when the CAM comes into effect) have been formulated and presented within the efficiency submissions on exactly the same basis as the Years 1-2 numbers. Estimated year-on-year savings do not yet appear to have been explicitly analysed and linked to specific activity types, with no detail on, for example, how a given initiative may affect volumes of activity or unit rates.

However, most of the routes appear to have begun applying assumed incremental cost savings in unit rates within the forward-looking work banks that underpin the CAM. There is likely to be scope for this process to develop further and more concrete and detailed linkage to specific activity types as the efficiency proposals develop.

The potential for volume efficiencies is not yet clear. "Embedded efficiencies" (savings that accrue as a result of adopting practices in line with revised asset policy) are still assumed to be zero. Although the FDP reflects activity volumes Network Rail has committed to deliver during CP5, it is assumed that the volumes shown already reflect efficient practice – meaning they are regarded as *post-efficient* volumes. However, Network Rail has stated there is scope for further volume efficiencies compared to the FDP in future (subject to approval).

Overall, the efficiency process is in its early stages and we expect the advancement and degree of maturity of efficiency measures to develop significantly going forward.

4.2.4 Key findings: positive management actions

The CAM efficiency plans developed to date have largely been the product of desktop exercises led by the RAMs in each route and overseen by the central team. There is limited evidence of specific programmes and projects dedicated to the delivery of the efficiencies.

Although overall ownership of the efficiencies planning has been taken by the RAM teams, achieving the savings will require extensive involvement of Investment Projects (IP) teams who deliver the majority of renewals works. In all three of the routes visited, it was evident that RAMs have been engaging with IP colleagues in the development CAM efficiencies plans, although the engagement appears to be relatively informal at this stage.

There was no evidence seen of external benchmarking applied to CAM efficiencies development thus far.

It was noted that there is a dependency on external contractors and the supply chain to deliver the bulk of the planned savings. Although the RAMs described, on the whole, positive “buy-in” and “political support” on the part the supply chain, Network Rail has indicated that there is not yet any binding contractual mechanism for efficiencies.

Some of the RAMs described measures they have in place to review and monitor progress in efficiency implementation going forward. However, as described in the previous section, quantified details of cost savings for particular activities are still to be developed, therefore monitoring and tracking back efficiencies against individual initiatives will remain challenging until the more specific quantified proposals are established.

Significant long-term efficiencies in CP5 are likely to come from ‘better selection’ of interventions on long-term whole life cost basis as well as reduced unit costs.

Going forward, we consider that CAM efficiency plans need to be managed and resourced as business change activities. Significant long-term changes to processes and practices will be necessary, which will require a substantial level of management effort to be successfully and sustainably implemented.

4.2.5 Key findings: robustness & sustainability

It is not yet possible to provide an opinion regarding robustness & sustainability impacts given limited detail and maturity of proposals.

Details of the impact of proposed measures on volumes, interventions, work mix, etc. have not yet been developed within early stage efficiency plans. As more detailed and specific plans that relate efficiency proposals to individual activity types are developed we consider the level of certainty around robustness & sustainability should improve.

Sustaining efficiencies whilst ensuring long-term output delivery will depend on positive management actions becoming embedded as “business as usual”; as described previously, treating efficiency improvements as a long-term business change programme should support this.

5 Reporter Opinion

These following are our interim findings based on the progressive assurance undertaken to date.

Only three routes have been visited therefore our findings may not be fully representative. We believe it would be beneficial to visit more of the routes to ascertain if the approaches observed are more widespread and whether there are further alternatives we have not yet seen and considered.

In terms of our review we have had to assume that Routes are all complying with Policy, implementing Policy Guidance and delivering outputs and outcomes as planned.

Whilst 'top-down' guidance and templates have been provided for Structures we have observed that there are different 'bottom-up' approaches between the three Routes in terms of work bank development, pricing and application of efficiencies.

5.1 Conclusions – Costs

5.1.1 General

It is important to highlight that centrally derived unit rates are likely to account for less than 50% of the CAM submission. The use of a wide variety of approaches to estimate non-unitised costs results in a greater risk of inaccuracy.

Of the routes visited, each has adopted alternative approaches to costing the CAM work bank. There is no single process adopted across the routes and this raises some issues such as the visibility of first principle estimates, the use of national versus route rates and the accuracy and completeness of alternative approaches. Approaches observed included bottom up estimating and more subjective adjustments to central unit rates based on the experience of the RAM.

Evidence was obtained of independent bottom up estimates for interventions that whilst based on low sample sizes, were of good quality. This reflects that in some of the routes there is evidence that work is being undertaken to build a more accurate understanding of unit rates rather than relying fully on national unit rates.

As per our findings under mandate A0/34 Network Rail does not appear to have made progress in quantifying and analysing the level of risk included in route submissions. This is not an acceptable position when undertaking major programmes of work and does not provide sufficient confidence that Network Rail can deliver to cost targets without understanding the risks it is trying to manage and their potential impact and cost.

Finally, in our discussion with the routes no examples of external benchmarking comparisons were obtained or evidenced.

5.1.2 Structures

The methodology behind national unit rates is well understood and all major variables (region, inflation, efficiencies) have been considered by Network Rail; however we consider the unit rates have the potential to be overestimated based on the benchmarking approach adopted. The approach used requires further explanation and evidence that it is a robust approach and reflects significant issues such as economies of scale between similar interventions. We also note that there are no unit cost reductions gained from efficiencies from 2006-2011 and that routes are currently using both SBP rates and route adjusted unit rates. For the CAM submission the source of the unit rates used needs to be much clearer.

5.1.3 Earthworks & Drainage

The methodology behind national unit rates is well understood and all major variables (region, inflation, efficiencies) have been considered. There is also a high level of use of the national rates by the routes.

As identified in the earlier chapter, the issues identified by Arup under mandate A0/34 were relatively small in comparison to structures unit costs however an update on whether these issues have been considered would be beneficial and provide greater confidence.

5.2 Conclusions – Efficiencies

Efficiency plans are in an early stage of development. Although SBP-based efficiency initiatives provide a logical and comprehensive framework the efficiency material presented to date is high-level, with estimations of efficiency savings based on subjective judgement in several areas.

There is limited quantified detail linking proposed measures with actual volumes and unit costs and it is not apparent to what extent Years 1-2 efficiencies are factored into forward-looking plans.

Plans to date are largely the result of a desktop exercise. We have seen limited evidence so far of specific programmes / projects / entities being established at route level that are dedicated to the delivery of efficiencies.

Significant long-term efficiencies in CP5 are likely to come from ‘better selection’ of interventions on long-term whole life cost basis as well as reduced unit costs.

Although overall ownership of the efficiencies planning has been taken by the RAM teams, achieving the savings will require extensive involvement of Investment Projects (IP) teams who deliver the majority of renewals works. In all three of the routes visited, it was evident that RAMs have been engaging with IP colleagues in the development CAM efficiencies plans, although the engagement appears to be relatively informal at this stage.

Within the efficiency plans there is a very high reliance on achieving efficiency through IP and the Supply Chain. IP have “bought in” to delivering to unit rates

but we understand that binding agreements are not yet in place with the supply chain. Many supply chain efficiencies targeted will be difficult to evidence.

The process to monitor efficiencies through CP5 is still being developed. Going forward, we consider that CAM efficiency plans need to be managed and resourced as business change activities. Significant long-term changes to processes and practices will be necessary, which will require a substantial level of management effort to be successfully and sustainably implemented.

At this time it is not yet possible to provide an opinion regarding robustness & sustainability impacts of CAM efficiencies, given the limited detail and maturity of proposals.

6 Next Steps

Based on our interim findings we believe there are a number of areas where further investigation or focus would add greater value. These are summarised as follows.

6.1 Costs

Unit rates comprise less than 50% of the submission. Testing the sources of other costs submitted by the routes would provide greater confidence in the robustness of the overall submission. This includes route led benchmarking, bottom up estimates and historic trends and levels of expenditure.

Linked to this analysis is a need to develop a better understanding of risk included in the route submissions. On a programme of this scale risk should be explicit and be fully understood by all parties. Failure to address this is likely to result in risk averse approaches at route level and the potential to double count or overstate risk.

Risk is also included in unit rates. Testing the degree of risk incurred on actual projects would also provide benefit and lead to a fuller understanding of the quantum included in the proposal; and

Finally, the approach taken to estimating structures unit rates should be tested to ensure it is reflecting the economies of scale of such a large programme of work. Initial evidence suggest that there is a potential to overstate costs.

6.2 Efficiencies

Our analysis has highlighted that 3rd party efficiencies are a significant risk. An analysis of these efficiency statements and the measures needed to successfully deliver them on a route by route basis would provide greater value to Network Rail.

Using this analysis and Quantitative Risk Analysis (QRA) would give Network Rail a clearer indication of the relative risks to delivery and help focus attention on those efficiency measures that have the greatest impact.

We also consider that developing a basic framework for managing and monitoring efficiency projects would be beneficial. No such framework exists in any of the routes visited in the course of our analysis and without even a basic framework it is unlikely the routes will develop the necessary management controls in sufficient time. This presents a risk to delivery of the stated efficiencies.

Finally, as identified in this report, the ownership of the asset intervention strategy (E.g. either with the DRAM or IP) varies from route to route and has significant implications for how efficiency is achieved. Considerable flex appears to exist between the DRAM or RAM's assessment of the intervention needed and the "on the ground" view presented by IP. Identifying on a route by route basis which approach is being adopted would help to identify whether related efficiency projections are robust.