

ORR & Network Rail

**Network Rail bottom up
benchmarking review:
benchmarking of operations costs**

Final Report – Executive Summary

2 March 2012

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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Executive summary

0.1 Introduction

0.1.1 Background

Network Rail began a programme of bottom-up benchmarking activities in 2010, focusing on operations, maintenance and renewals activities and costs. Network Rail has indicated that it is aiming to use benchmarking both to identify initiatives to improve performance during CP4 outputs and to develop “informed and evidenced plans” for CP5.

In our role as Independent Reporter (the Reporter), Arup reviewed the Company’s bottom-up benchmarking activities for the maintenance and renewals workstreams as part of Mandate AO/15, and submitted a final report related to the original scope in January 2011¹. ORR and Network Rail subsequently extended that scope of the mandate to include a review of the Company’s international operations benchmarking. This report contains the findings of our review of Network Rail’s benchmarking of operations expenditure.

The purpose of this review is to provide assurance that Network Rail’s international operations expenditure benchmarking process is appropriate, and to assess the data and methodology used to complete the benchmarking work. Our methodology has combined meetings with Network Rail and a desk-based review of the information provided to us by the Company.

0.1.2 Operations expenditure and CP5 efficiency assumptions

Non-maintenance operating expenditure (opex) accounted for more than £1.4bn of annual expenditure during the last financial year (2010/11). This represented 28% of Network Rail’s total annual operations, maintenance and renewals expenditure. Network Rail and the ORR have agreed that approximately £900m of total opex can be defined “controllable” – meaning that management decision-making can influence corporate spending and impact efficiency, with the remaining opex categorised as “non-controllable”. Network Rail divides controllable opex into two categories, “Network Rail—Operate” and “Support” costs.

Network Rail—Operate (“Operate”) expenditure combines headcount costs, station costs (including staff), weather resilience costs and other costs.² In total Operate costs account for around £420m of annual expenditure (46% of Network Rail’s total £900m controllable opex). Signallers are the largest single item within Operate costs, comprising approximately half of Operate costs (£200m), or 24% of total controllable opex.

¹ See Arup report “Mandate AO/015: Network Rail Bottom-Up Benchmarking Programme Audit, versions 1.1, 23rd January 2012.

² We detail Network Rail—Operate headcount expenditure by area in Figure 3 of the main body of this report.

In January 2013 Network Rail will publish its Strategic Business Plan (SBP) setting out in full its CP5 expenditure proposals. This will build on the initial analysis of efficient CP5 expenditure levels set out by Network Rail in the Initial Industry Plan (IIP), which was published in September 2011. The ORR has stated in its draft requirements for the SBP that it should draw, *inter alia*, on benchmarking studies and models.

Network Rail's operations benchmarking focuses on comparing signalling labour costs with those borne by other railways. In making comparisons to other railways, Network Rail takes into account differences in network characteristics, labour characteristics and wage data.

0.2 Operations expenditure process assurance

In the course of our review, Network Rail explained its operations expenditure benchmarking to us, illustrating the approach by showing us the questionnaire through which it gathered data, the spreadsheets used to undertake its analysis and the report that it subsequently wrote up to set out the findings.

0.2.1 Programme scope

Network Rail has indicated that signaller costs have been prioritised as an area of focus in the opex benchmarking, because these account for a significant proportion – around 24% - of total controllable opex expenditure, and they represent the largest single controllable opex cost category.

Network Rail also indicated that its focus on signalling labour costs arose as a consequence of key findings contained within the Rail Value for Money study. The study concludes that “one potential reason for relatively high costs in Great Britain is that Network Rail has fewer control centres and too much manual signalling.”³ Network Rail also informed us that it agreed with the ORR that it was appropriate to focus on signaller costs during the period in which ORR has been preparing its advice to ministers (due to be given in February 2012). We understand that at the present time, no specific plans or timescales are agreed between Network Rail and the ORR for extending the opex benchmarking programme into other areas of controllable opex expenditure.

0.2.2 Analytical approach

Network Rail's approach to operational cost benchmarking has been largely top-down, based on high-level national comparator data, albeit with a significant degree of granularity with detailed information and analysis of network size, density and infrastructure characteristics. Network Rail has stated that it considers a top-down approach has enabled the programme to advance more quickly than a detailed bottom-up approach, noting that benchmarking signalling costs may not

³ Department for Transport and Office of Rail Regulation, “Realising the Potential of GB Rail: Final Independent Report of the Rail Value for Money Study (Detailed Report),” May 2011, page 38.

require bottom-up observations of activities, given the variability between individual working processes is likely to be limited.

Network Rail has however supplemented its top-down approach with bottom-up analysis of labour costs, engaging with other European rail organisations to focus principally on differences in technologies and systems. In addition, Network Rail has completed a separate bottom-up study simulating changes in operations rostering. The study does not benchmark comparators' rostering costs, instead basing its analysis on implementation of more efficient and flexible staff deployment patterns.

0.2.3 Benchmarking methodology

Network Rail has employed a survey methodology to collect data. Limited survey responses have supplemented desk-based research and other existing sources, including the Lasting Infrastructure Cost Benchmarking (LICB) database and international rail comparator data compiled by Civity as part of the Rail Value for Money study. Network Rail reports that it began collecting operations data by sending questionnaires to comparator organisations via e-mail and meeting with representatives of international operators.

Network Rail solicited information from international railway comparators and large UK companies considered to be comparable “safety critical operators.” Network Rail contacted railway operators in 12 European countries and also collected descriptive statistics about national (and sub-national) networks for several non-European countries, including Japan, Australia, the USA, Canada, India, China and Russia.

Given the limited response rate (with only two comparator datasets directly obtained to date), Network Rail has endeavoured to complete the dataset by searching for publicly available data and by making a range of assumptions and calculations.

0.2.4 Relevance to CP5 business planning

Network Rail has indicated that it has not yet been able to source sufficient comparator data to establish standardised set of comparator metrics / KPIs through which operating costs can be benchmarked between Network Rail and overseas comparators on a quantified basis.

We understand that for the quantification of CP5 opex efficiencies Network Rail has instead focused on the development of the business case for its Network Operating Strategy (NOS), which targets signalling box rationalisation and technology investment. Network Rail has indicated that it considers the results of the opex benchmarking analysis undertaken to date supports the argument for the implementation of NOS. (We note that the NOS business case has not formed part of our review under this mandate.)

0.2.5 Potential for future benchmarking activities

Having developed a framework for benchmarking operations costs, Network Rail has drawn our attention to the potential for future benchmarking between devolved routes in Great Britain. Network Rail considers that devolution is likely not only to support internal benchmarking, but may also facilitate benchmarking with overseas rail networks on a more comparable basis. For example, devolved routes in southeast England may provide operations costs data with a greater degree of comparability to smaller, denser European networks, compared to the current data available at the national network level.

0.2.6 Operations expenditure process assurance: Opinion and recommendations

Comparator engagement

Overall, we consider that Network Rail has taken a proactive approach to engaging with engagement with comparator organisations, and that Network Rail staff participating in this work have demonstrated a long-term commitment to operations benchmarking activities.

Our discussion with the company provided us with a clear sense of the process by which Network Rail defined the programme's scope, created a benchmarking methodology and acted to complete the work. We find that Network Rail has endeavoured to develop an operations cost benchmarking programme, agreeing a scope of work with the ORR in line with the findings of the McNulty report and developing a survey methodology to gather data. We also find that Network Rail has contacted a range of comparator railways throughout Europe, and that Network Rail has developed a good knowledge of other company's networks and operations. We note that the comparator railways contacted are likely to have received several data requests from various parts of Network Rail over the past year. We consider that there may be potential for securing more data in this area through stronger coordination with Network Rail's renewals and maintenance benchmarking workstreams. We recommend that Network Rail continues to emphasise partnership and personal contact in developing relationships with comparator rail organisations. As we suggested in our main review of the company's bottom-up maintenance and renewals cost benchmarking, a formal benchmarking club, including transparent data sharing, could have a positive impact on Network Rail's access to comparator data.

We also consider that it may be worthwhile for Network Rail to enlarge its sample to include other railway operators and other safety critical organisations. Additional organisations could include:

- London Underground;
- Non-European international rail operators, especially those in North America; and
- NATS, the UK air traffic service provider, which has reduced operational expenditure significantly following restructuring and part-privatisation.

Programme scope

Given the significant levels of controllable opex expenditure relating to signalling (the largest single cost item, accounting for around 23% total controllable opex), together with the findings of the McNulty report which identified signaller costs as a significant area of potential cost saving, our view is that the primary focus on signalling is reasonable.

However we note that if the ORR wishes to gain a comparative overview of other (non-signaller) areas of controllable opex, there is not yet an agreed programme of work to benchmark these areas.

The ORR has stated that, along with Network Rail, it believed the focus on signalling costs to be reasonable in advance of its provision advice to Ministers (due on 15th March 2012). We understand that the ORR and Network Rail have not decided if non-signaller opex should be benchmarked as part of the periodic review process. We consider that the scope of any further benchmarking requires agreement between Network Rail and the ORR as soon as possible, in order to allow sufficient time to obtain benchmarking analysis that supports comparative analysis of efficiency in these areas.

Benchmarking approach

We consider that forthcoming decentralisation of Network Rail's operational structure could present opportunities for internal comparative operations costs data to be obtained and compared between operating routes. This could support comparative efficiency analysis, in a number of areas, e.g. comparison of the operations costs of routes with centralised signalling to those of routes without it.

Whilst we consider the current top-down approach could yield an appropriate understanding of operations costs with comparator organisations, we recommend that Network Rail combines the top-down data with the various forms of bottom-up benchmarking data collected through previous analyses, e.g. information obtained in relation to rostering practices in the UK and comparator railways. We consider that combining information on this basis may enable Network Rail to gain a more holistic overview of relative cost levels and potential efficiency levels that could be achieved.

0.3 Operations expenditure benchmarking data analysis

0.3.1 Non-survey data sources

Having received only limited responses to its requests for information from other European railways, Network Rail has sought alternative, publicly available sources when comparator cooperation was not forthcoming. The Lasting Infrastructure Cost Benchmarking database (LICB) is Network Rail's principal source for operations benchmarking. Network Rail has also obtained data from a range of other (generally publically available) sources, citing 68 sources within the reference tab of the Excel file. This includes statistics from several operators'

annual reports, company websites, company presentations, companies' internal cash flow statements, and internet searches.

0.3.2 Referencing and citation

Network Rail has provided a complete reference list and has cited clearly the source for each data point. We consider the citation format appropriately conveys source material, including year of publication and author, although in some instances partial information has been provided (e.g. "internet source").

0.3.3 Calculation sheet and inputs

Network Rail's approach focuses on establishing comparative signalling labour costs based on headcount data, network characteristics, safety statistics and other differentiating information. Network Rail has indicated that headcount data has been used, rather than labour hour or labour unit cost data because comparator railways are more willing to share staff numbers, or such data is more readily available through publicly available sources.

Benchmarking data has been collated in an Excel worksheet. This contains a list of comparator characteristics and staffing information. The majority of data relate either to headcount characteristics or to network characteristics. Additional data relating to salary costs and safety have also been collected. The data feed into employee density and network density calculations, and into "detailed data" characteristics and calculations. A lack of data is apparent both at the level of general summary statistics, where some important "totals" are missing (e.g. number of SEUs) and at the level of more granular data (e.g. "% of SEUs of technology type: Solid State/Computer Based").

Network Rail is confident in its ability to draw inferences based on the data it holds, explaining where specific network, headcount or technology characteristics are not available, it has "reverse engineered" data in several instances, making estimations based on the characteristics of other similar comparator rail networks. On this basis, Network Rail has estimated some operations headcount.

0.3.4 Results and conclusions drawn from the data obtained

Based on the analysis undertaken to date, Network Rail has presented the results obtained in the unpublished report, "PR13 Progressive Assurance Supporting Document - Operations Benchmarking Report."⁴ This document sets out:

- Network Rail's approach;
- the response of comparators to date;
- background factual data and analysis to support the benchmarking (principally focused around infrastructure characteristics for the respective comparators);
- detailed calculations and comparisons of the levels of signalling resource and costs for the different comparator networks;

⁴ PR13 Progressive Assurance Supporting Document Operations Benchmarking, January 2012, v.2.2

- assumptions made to “reverse engineer” and normalise comparator data; and
- initial results, combining the various calculations to give high-level comparisons of relative staff cost levels.

The report concludes that at present, whilst definitive conclusions cannot yet be drawn on the basis of data obtained to date, it can nevertheless be concluded at this stage, that:

- the operational cost of a railway is very strongly correlated to the type and volume of signalling asset that controls the network
- Network Rail is not currently at the “frontier” of operations cost efficiency, and there are efficiencies that can be made
- the results obtained support the expected efficiencies that can be achieved through implementation of NOS.

Network Rail also considers that the results could form for the basis of further study, focusing primarily on European comparators are most similar to the UK to gain a more detailed insight into relative operating cost and efficiency levels.

0.3.5 Operations expenditure benchmarking data analysis: Opinion and recommendations

Overall, we consider that Network Rail’s approach to gathering and analysing data appears reasonable.

Network Rail has stated that it intends to improve the level of data coverage and range of sources to support its analysis (building on current internet-based data it has gained so far), although it considers this to be a long-term goal.

We consider Network Rail should seek to further advance and broaden its data analysis, drawing upon a wider scope and range of data, to improve the robustness and scope of its benchmarking analysis to support its CP5 efficiency proposals. We consider that the data gathered to date lack sufficient scope to generate statistically significant benchmark calculations. In particular, a small number of cross-sectional data points (i.e. data from a single year) limit Network Rail’s ability to comment on how levels of technology have impacted on costs over time. Even as Network Rail gains additional cross-sectional data, we consider that it may be worthwhile for Network Rail to assess ways of increasing the statistical significance of its results, either by using time-series data or supplementing these results with detailed bottom-up cost data and analysis, such as the analysis undertaken through its rostering modelling. We consider that increasing the scope of data obtained should help improve the robustness of its comparative analysis of opex cost and efficiency, by increasingly replacing assumption-based calculations with actual data.

We recommend that Network Rail develops a robust standardised comparator metric or KPI through which operating costs can be compared on a regular basis between different rail / infrastructure operating organisations. For examples, a

benchmark measure of average cost per employee, which could be compared both against other operators and against an average rate for other skilled manual / “blue collar” roles within infrastructure operating organisations.

0.4 Summary of recommendations

We summarise in the table below the recommendations made in this report.

Reference	Area	Recommendation
2012.BUB.1	Sample	We recommend that Network Rail should consider enlarging its sample to include other railway operators and other safety critical organisations. We consider that establishing a benchmarking club may be one route towards achieving this.
2012.BUB.2	Benchmarking approach	We recommend that Network Rail develop a plan for benchmarking of costs within the company between operating routes, for example with centralised signalling to those of routes without it.
2012.BUB.3	Benchmarking approach	We recommend that Network Rail combine the top-down opex benchmarking data obtained with the various forms of bottom-up benchmarking data collated through previous analyses (e.g. in relation to rostering practices in the UK and comparator railways).
2012.BUB.4	Output - Key Performance Indicators	We recommend that Network Rail continue to work towards developing a robust standardised high-level benchmarking metric or KPI through which operating costs can be compared on a regular basis.