

Assessing Network Rail's relative efficiency and the challenge we have set the company

Assessing Network Rail's relative efficiency and making assumptions about the scope for the company to improve its efficiency are important parts of our work to regulate Network Rail and determine access charges and other funding the company receives. This leaflet summarises the work we have done to assess Network Rail's efficiency and explains the judgements we have made about the improvements in efficiency we consider the company can make over the five years from April 2009 to March 2014.

Our determination for 2009-14

In October 2008 we published our determination of Network Rail's outputs and funding for control period 4 ("CP4"), which runs from 1 April 2009 to 31 March 2014. The outputs the company needs to deliver include significant improvements in train reliability, network capacity and safety. In order to deliver these outputs we determined that the efficient level of access charges and other funding the company requires is £28.3bn (in 2009-10 prices).

Efficiency improvement

Assessing the scope for the improvements by Network Rail in its efficiency was a central part of the work that led to our determination. This enables us to determine the level of access charges and other funding, reflecting the scope for efficiency improvement that we consider is achievable by the company. We judged that Network Rail ought to be able to reduce its controllable operating, maintenance and renewals expenditure ("OM&R") on the rail infrastructure by at least 21% over the five years of CP4, compared to the company's proposals of around 12.5%.

This expected improvement in CP4 will build on the 27% OM&R efficiency achieved in control period 3 (CP3), which ran from April 2004 to March 2009.

Our approach to determining efficiency

In making our judgements on Network Rail's efficiency for CP4 we went through two stages:

1. **Total scope for efficiency improvement.** We undertook analysis to understand the total amount of improvement in efficiency that Network Rail could make. We reviewed Network Rail's own proposals and undertook extensive work ourselves.
2. **Judgements on improvement achievable in CP4.** We considered the amount of improvement in efficiency that Network Rail should be able to make in CP4 taking into account the speed at which efficiency improvements should be able to be made by the company, as part of our overall determination.

What our efficiency assumptions mean for Network Rail's expenditure

In making our determination for CP4 we assumed that Network Rail needs to undertake OM&R and enhancement expenditure of £30.7bn, compared to the £33.6bn proposed by the company. Approximately £2bn of the £2.9bn difference is due to the additional improvements in efficiency that we consider the company can make in CP4.



Assessing the scope for efficiency improvement in maintenance and renewals

Benchmarking maintenance and renewals

A focus of our work was to assess efficiency covered maintenance and renewals expenditure, which accounts for more than half of Network Rail's expenditure in CP4.

International benchmarking

Network Rail has no direct domestic comparators, so we used international benchmarking as a core part of our efficiency assessment. We compared Network Rail to rail infrastructure managers in other countries, predominantly in Western Europe. The work involved a range of 'top-down' and 'bottom-up' studies to benchmark Network Rail's total maintenance and renewals expenditure and its asset management.

Econometric analysis

Using the International Union of Railway's (UIC's) 'lasting infrastructure cost benchmarking' (LICB) dataset we undertook econometric analysis to produce a measure of Network Rail's (and its predecessor Railtrack's) efficiency compared to the 13 west European rail infrastructure managers included in the LICB dataset.

Our results

Our results showed that Network Rail faced an efficiency 'gap' of 35% compared to the upper quartile of the European infrastructure managers in 2008-09, at the end of CP3. The upper quartile is the is equivalent to the third best western European infrastructure manager. The chart on the right shows Network Rail's relative efficiency score (where a value of 1 on the y-axis represents the upper quartile). The blue line shows Network Rail's (and its predecessor Railtrack's) relative efficiency upto the end of CP3. The dotted line shows our assumption on the efficiency improvement in CP4, where we have assumed that Network Rail will close two-thirds of the gap between it and the upper quartile.



The three aspects of efficiency

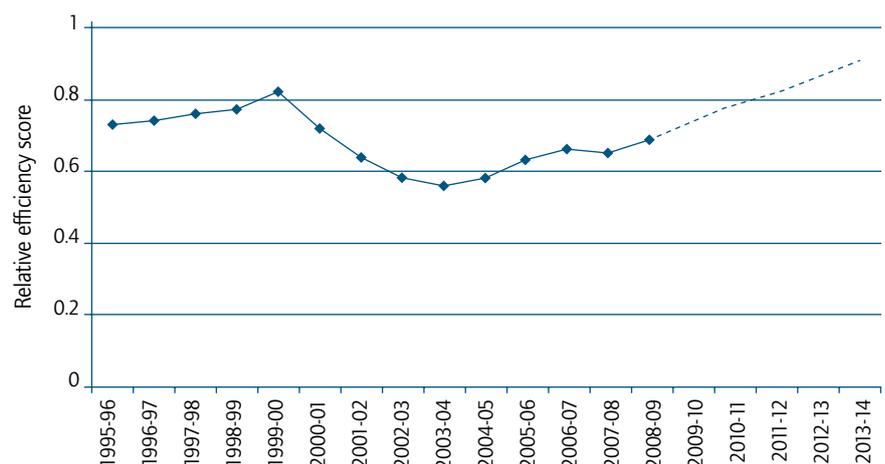
In assessing efficiency we consider three separate aspects:

1. **Catch-up efficiency.** The efficiency improvement that Network Rail should make in order to close the gap between itself and the best (or better) performing companies against which we have benchmarked it.
2. **Frontier-shift efficiency.** The continual improvement in efficiency that would be expected from even the best rail infrastructure managers due to ongoing innovation and the implementation of new technologies or working methods.
3. **Input prices.** The impact of expected input price inflation on Network Rail's cost base which reduces the effective level of efficiency improvement possible.

EWS efficiency studies

EWS, now DB Schenker, commissioned LEK and TTCL to benchmark Network Rail's costs with the privately owned railroads in North America. While recognising that there are significant differences between Europe and North America, the study found that over the three decades since de-regulation the North American railroads achieved productivity improvements of between

4-5% annually. On the basis of the consultants' study the North American railroads are significantly more efficient than Network Rail. EWS also commissioned Lloyd's Register Rail to examine track renewals efficiency. They identified possible savings in track renewals of more than 30%, partly through use of modular S&C renewals.



Understanding the efficiency gap

Given the significant efficiency gap exposed by our econometric analysis, we undertook engineering based work to understand the gap. This work supported the results of our econometric analysis and confirmed the scope for Network Rail to improve its maintenance and renewals efficiency during CP4.

Best practice studies

During 2007 we made visits to rail infrastructure managers in Europe, North America and Australia. These visits enabled us to understand how other infrastructure managers operate and highlighted a range of engineering and asset management approaches that could be used by Network Rail to improve its efficiency. Examples of potentially more efficient practice identified included:

- > Evidence of better asset management.
- > Use of innovative asset inspection methods.
- > More use of risk based maintenance.
- > Quicker processes for taking and giving up track possessions than is currently achieved in Britain.

Building on our visits, in order to understand in more detail the differences in the level of cost between Network Rail and Europe, we commissioned RailKonsult to identify different technologies and working methods used in Europe which could help account for the differences in efficiency between Network Rail and its peers (see box below).

We also commissioned Lloyds Register Rail to compare Network Rail's possessions management with a number of overseas rail infrastructure managers. They found scope for improvement in the way Network Rail takes possessions, including more use of single line working.

BSL study

Network Rail commissioned BSL management consultants to help understand the efficiency gap. As part of the study BSL highlighted a range of opportunities for Network Rail to improve its efficiency, including:

- > Improved utilisation of the tamper fleet.
- > Economies of scale
- > Increasing the effective working hours within a possession
- > Reducing transactions costs relating to project planning and overheads.

Highlights of the best practice studies

Asset inspection and asset management. In general best practice European railways undertake fewer track inspections but inspections are generally of higher quality and are often carried out by inspection train rather than foot patrol. Coupled to a user friendly asset management system, this allows early identification of faults which in turn enables intervention before problems emerge. Similar techniques applied in Britain could reduce foot patrolling inspection and other costs.

Recycling components. This is common European practice. In Switzerland, for example, rail, sleepers and other components are regularly refurbished and cascaded from higher to lower category routes. This could lead to savings in Britain. In addition ballast cleaning (partial renewal) instead of traxcavation (full renewal) could reduce ballast renewal cost in Britain.

Partial renewal of switches and crossings. Life cycle costs are minimised under European best practice by "second life" processes which replace only the components which are worn out and extend the life of others. Network Rail has recently committed itself to carrying out more partial renewals but European practice could materially reduce S&C renewal costs in Britain.

High output rail stressing. Stressing continuously welded rail by heating it rather than physically stretching it was discontinued in Britain in the 1960s and 1970s. Some European networks (using modern equipment) have re-introduced this method which doubles on-site productivity.

Formation rehabilitation trains. Modern high output European plant is regularly used to undertake formation and also ballast renewals. If applied to Network Rail's CP4 relevant track renewals it could reduce unit costs significantly.

Use of dedicated teams. Contractors are widely used by most continental railways, as they are in Britain. However there is generally a greater degree of specialisation by activity in Europe (e.g. S&C renewal or tamping). This ensures a highly skilled and productive workforce dedicated to particular tasks in contrast to the situation in Britain where contractors are often not even dedicated to rail. The savings are difficult to quantify but RailKonsult considers that there are real opportunities to improve efficiency in Britain through this initiative.

Operating expenditure efficiency

We assessed the scope for efficiency improvement in Network Rail's operating expenditure. We assessed the improvements in operating efficiency over time in utilities and other regulated companies. We used this information in our assessment of the gap that Network Rail faces in its operating expenditure efficiency. We estimated that the gap is approximately 35% at the end of CP3.

To support our work on operating expenditure efficiency we assessed of Network Rail's total employment costs, which found that these are between 15%-20% greater than external market benchmarks. We also analysed Network Rail's proposals for managing its operational activity in CP4, which highlighted a range of opportunities to improve efficiency.

Frontier shift efficiency

We examined the scope for annual productivity improvement applicable to Network Rail. Annual efficiency improvements of between 0.2% - 0.9% each year in CP4 can be expected by Network Rail in its OM&R expenditure in addition to the improvements in efficiency due to catch-up.

Input prices

Network Rail submitted evidence to us on the likely level of increases in the costs of its inputs above general inflation. We accepted this evidence that projected, on average, the company's input prices related to its OM&R expenditure would increase by around 1% each year in CP4. We reduced our final efficiency assumptions to reflect this.



Our judgements on efficiency

We made our judgements on Network Rail's efficiency improvement in CP4 in the context of our overall determination, which is a package of judgements and decisions. It includes the outputs Network Rail needs to deliver, the efficient level of access charges and funding, the obligations in Network Rail's licence, our monitoring and enforcement of the company, the financial framework and the protections for Network Rail against risk and uncertainty, and the incentive arrangements.

By the end of CP4 Network Rail will have been the owner of the rail infrastructure manager for 12 years and the company aspires to be a 'world class' organisation. As such, we consider that Network Rail should be able to close two-thirds of the efficiency gap between it and the most efficient European rail infrastructure managers. This is achievable given the scope for the company to implement new technologies and working methods during CP4. Network Rail has now implemented its transformation plan, which should strengthen the company's capabilities, improve its partnerships with its customers and suppliers and put it in a better position to deliver in CP4.

Our assumptions on OM&R efficiency are shown in bold in the table below. We kept our assumptions relatively low in the first two years of CP4 to provide Network Rail with more time to plan and implement its initiatives for CP4.

Incentives

Our determination puts strong incentives on Network Rail to improve its efficiency to achieve and outperform our determination. We have implemented a new 'efficiency benefit sharing mechanism' which incentivises train operators to work with Network Rail and identify opportunities to improve efficiency as they share a proportion of the benefits.

Ongoing work to assess efficiency

During CP4 we will continue to improve our understanding of the scope for Network Rail to improve its efficiency. We will publish reports each year on Network Rail's efficiency performance compared to both our determination and its international peers.

Enhancement efficiency

We assessed the efficiency savings that could be made on Network Rail's proposed £9.7bn of enhancement expenditure in CP4. Of the £1.5bn billion reduction we made, approximately £900m of this was due to improvements in efficiency. Our assessment was based on engineering assessment of the proposed schemes and we also applied an annual frontier-shift efficiency assumption of 0.7% and an assumption that Network Rail will be able to make savings of 5% across much of its programme through scope efficiencies. We retained Network Rail's proposals for input price inflation.

Our CP4 efficiency assumption

	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Controllable opex	2.8%	2.8%	4.0%	4.0%	4.0%	16.4%
<i>Network Rail proposal</i>	2.1%	2.2%	1.6%	1.1%	0.6%	7.4%
Maintenance	3.2%	3.2%	4.0%	4.5%	4.5%	18.0%
<i>Network Rail proposal</i>	3.1%	3.0%	2.7%	2.5%	1.5%	12.2%
Renewals	5.0%	5.0%	5.5%	5.5%	5.5%	23.8%
<i>Network Rail proposal</i>	4.1%	3.7%	3.2%	2.9%	1.8%	14.8%



OFFICE OF RAIL REGULATION

The Office of Rail Regulation (ORR), established in July 2004 under the Railways and Transport Safety Act 2003, is an independent statutory body led by a board, with responsibility for the safety and economic regulation of the national rail network and other aspects of rail services. It is also the safety regulator for other railways, including underground railways, heritage railways and trams.