Realising the Potential of GB Rail

Final Independent Report of the Rail Value for Money Study

Detailed Report

May 2011

Although this report was commissioned jointly by the Department for Transport (DfT) and the Office of Rail Regulation (ORR), the findings and recommendations are those of the authors and do not necessarily represent the views of the DfT and the ORR. While the DfT and the ORR have made all reasonable efforts to ensure the information in this document is accurate, the DfT and the ORR do not guarantee the accuracy, completeness or usefulness of that information; and cannot accept liability for any loss or damages of any kind resulting from reliance on the information or guidance this document contains.

Department for Transport
Great Minster House
76 Marsham Street
London SW1P 4DR
Telephone 0300 330 3000
Website www.dft.gov.uk/rail-value-for-money

Office of Rail Regulation
1 Kemble Street
London
WC2B 4AN
Telephone: 020 7282 2000

© Crown copyright 2011, except where otherwise stated

Copyright in the typographical arrangement rests with the Crown.

You may re-use this information (not including logos or third-party material) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/ or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or e-mail: psi@nationalarchives.gsi.gov.uk.

Where we have identified any third-party copyright information you will need to obtain permission from the copyright holders concerned.

ISBN 978 1 84864 124 2

Contents

1. Introduction to the Level Two Report **8**

2. The Study background **9**

2.1 Study remit 9

2.2 Key areas for the Study 9

2.3 Methodology 11

3. Cost and revenue structure of the GB rail industry **13**

3.1 Rail industry outputs 13

3.2 Revenue 14

3.3 Overall cost structure 16

3.4 The call on the taxpayer 22

3.5 Conclusion 29

4. Benchmarking and cost savings **30**

4.1 Benchmarking 30

4.2 Potential for cost savings 40

5. Area A – Industry objectives, strategy and outputs **46**

5.1 Industry objectives 46

5.2 Strategy 53

5.3 Outputs 56

6. Area B – Leadership, planning and decision-making **70**

6.1 Leadership 70

6.2 Planning 76

6.3 Decision-making 82

7. Area C – Structures, interfaces and incentives **88**

7.1 Structures and interfaces 88

7.2 Incentives 105

8. Area D – Revenue **115**

8.1 Fares 115

8.2 Property and development 124

8.3 Car park facilities 129

8.4 Ticket barriers/gating 131

8.5 Other revenue 133

9. Area E – Asset management **136**

9.1 Asset management 136

9.2 Whole-system programme management 146

10. Area F – Supply chain management **156**
10.1 Supply chain management 156
10.2 Infrastructure UK and the GB rail industry 166
11. Area G – Safety, standards and innovation **169**
11.1 Safety 169
11.2 Standards 177
11.3 Innovation 185
12. Area H – People **192**
12.1 People 192
13. Freight **216**
13.1 Introduction 216
13.2 Executive summary 216
13.3 The GB rail freight industry 216
13.4 The economic benefits of rail freight 217
13.5 The environmental benefits of rail freight 218
13.6 Rail freight and the Rail Value for Money Study 218
13.7 Financial performance of the rail freight sector 219
13.8 Specific issues affecting the rail freight industry 221
13.9 Rail freight's contribution to value for money 224
13.10 Conclusion 226
14. Rolling stock **227**
14.1 Description of studies and analysis 227
14.2 Evidence base 227
14.3 Key data 228
14.4 Barriers to efficiency 235
14.5 Principal issues 236
14.6 Recommendations for cost reduction 237
14.7 Potential for, and timings of, cost savings 238
14.8 Implementation plan 239
15. Infrastructure management **240**
15.1 Infrastructure management and Network Rail 240
15.2 NR's performance compared with other railways 240
15.3 Network Rail's Transformation Programme 241
15.4 Challenges for CP4 and CP5 241
15.5 Assessing the likelihood of success 242
15.6 Findings 242
15.7 Overall conclusions 245

16. Information systems **246**
16.1 Introduction 246
16.2 Executive summary 246
16.3 The GB rail industry's information systems today 247
16.4 Potential solutions to the GB rail industry's IS legacy 248
16.5 Using IS to achieve value for money 249
16.6 A wider vision 250
16.7 Capturing new opportunities 253
16.8 Conclusion 253
17. Capacity management and utilisation **254**
17.1 Introduction 254
17.2 Summary of evidence from the Study's benchmarking work 254
17.3 Comparison with European railways 255
17.4 How does the UK compare in terms of train utilisation? 256
17.5 Where is the GB rail network under pressure? 257
17.6 What parts of the network are under-utilised and why? 258
17.7 Where are the key constraints on network capacity? 259
17.8 A whole-system approach to capacity utilisation 259
17.9 Opportunities for improving value for money 260
18. Other operational issues **262**
18.1 Introduction 262
18.2 Possessions management and the seven-day railway 262
18.3 Performance management and the National Task Force 264
18.4 Control and traffic management 266
18.5 Information systems and the customer 269
18.6 Summary 270
19. The lower-cost regional railway **271**
19.1 Introduction 271
19.2 Changing the concept of the regional railway 272
19.3 The technical characteristics of the regional railway 272
19.4 The operating characteristics of the regional railway 275
19.5 Learning from experience 276
19.6 Additional issues for implementation 277
19.7 Potential for cost reduction 278
19.8 Recommendations 278
20. Competition and contestability **280**
20.1 Overview of competition in the GB rail sector 280
20.2 On-rail competition in the GB rail sector 280
20.3 Increasing competition and contestability 282

21. Ownership change **283**
21.1 Background 283
21.2 The Study's approach 283
21.3 Private investment 283
21.4 Renationalisation 284
22. Infrastructure asset ownership **287**
22.1 Introduction 287
22.2 Ease of transition 287
22.3 Increased contestability 287
22.4 Public interest 289
22.5 Conclusions 289
23. Financial transparency **290**
23.1 Overview 290
23.2 Proposed reforms to improve financial transparency 291
24. Private investment **292**
24.1 Overview of private investment in the rail industry 292
24.2 Unsupported debt 293
24.3 Equity risk capital 293
24.4 Conclusions on private investment in Network Rail 295
25. Legal background **296**
25.1 Introduction 296
25.2 Key issues to be considered 296
26. Recommendations for regulation **300**
26.1 The main forms of regulation in the railway 300
26.2 Improving regulation 301
26.3 The capability of the ORR 303
26.4 The capability of the DfT 303
27. Issues relating to value for money **304**
27.1 Description of studies and analysis 304
27.2 Evidence base 304
27.3 Background information and key data 304
27.4 Barriers to efficiency 305
27.5 Principal issues 306
27.6 Recommendations 307
27.7 Potential for, and timings of, cost savings 308
27.8 Implementation plan 308

28. Approach to implementation **309**
28.1 Introduction – the management of change 309
28.2 A structure for change 309
28.3 The pace of change 310
28.4 Control Periods and franchise renewals 311
28.5 The phasing of change 312
28.6 The governance of change 314
28.7 Summary 314
29. Glossary **315**

1. Introduction to the Level Two Report

The Rail Value for Money Study has been sponsored jointly by the Department for Transport (DfT) and the Office of Rail Regulation (ORR). This report responds to the Terms of Reference set out by Lord Adonis, then Secretary of State for Transport, in February 2010.

Following the May 2010 General Election, the Study's general approach was endorsed by the new Secretary of State, the Rt Hon. Philip Hammond MP. The Study team is most grateful to him for his active engagement in, and support for, its work.

This final report from the Study is structured as follows:

- **Summary**, which contains:
  - Foreword;
  - an Executive Summary; and
  - the Level One report that sets out the Study's principal findings, recommendations and assessment of the potential for reductions in GB rail costs
- This Level Two document, the Detailed Report, which contains reports from each of the workstreams within the Study, including detailed analysis of data, issues and barriers, together with more detailed recommendations and analysis of potential cost savings. The Level Two report is available online at www.dft.gov.uk/rail-value-for-money.

Shortly after publication of the above two documents, the Study team will make available on-line the consultants' reports that the team has used in developing its analysis and recommendations..

The Study team wishes to thank its sponsors, the DfT and the ORR, for their help and support throughout, and is extremely appreciative of the input and advice from the many people throughout the industry who have participated in stakeholder groups, in workshops, or in other ways.

This report is the result of an independent Study. It is for Government, the ORR and the industry to decide whether and how to take the Study's recommendations forward.

May 2011

2. The Study background

2.1 Study remit

The previous Secretary of State for Transport announced the Study, jointly sponsored by the Department for Transport (DfT) and the Office of Rail Regulation (the ORR), alongside the Pre-Budget Report in December 2009. Its Terms of Reference were as follows:

1. To examine the overall cost structure of all elements of the railway sector and to identify options for improving value for money to passengers and the taxpayer while continuing to expand capacity as necessary and drive up passenger satisfaction.

2. In particular, to examine:

- *what legal, operational and cultural barriers stand in the way of efficiency improvements;*
- *the incentives across different parts of the rail industry to generate greater efficiency;*
- *the role of new technology, processes and working practices in fostering greater efficiency;*
- *ways of generating more revenue, e.g. car parking, gating at stations, better utilisation of property; and*
- *to make recommendations.*

3. The Study will examine the whole-industry costs and revenues and their composition. In doing so, it will look at comparable industries in the UK and abroad.

4. The ORR will be a joint sponsor of the Study. The ORR will remain responsible for delivering efficiency improvements by Network Rail (NR) and for safety regulation. The Study should take account of the ORR's benchmarking work for the period 2009–14 and beyond.

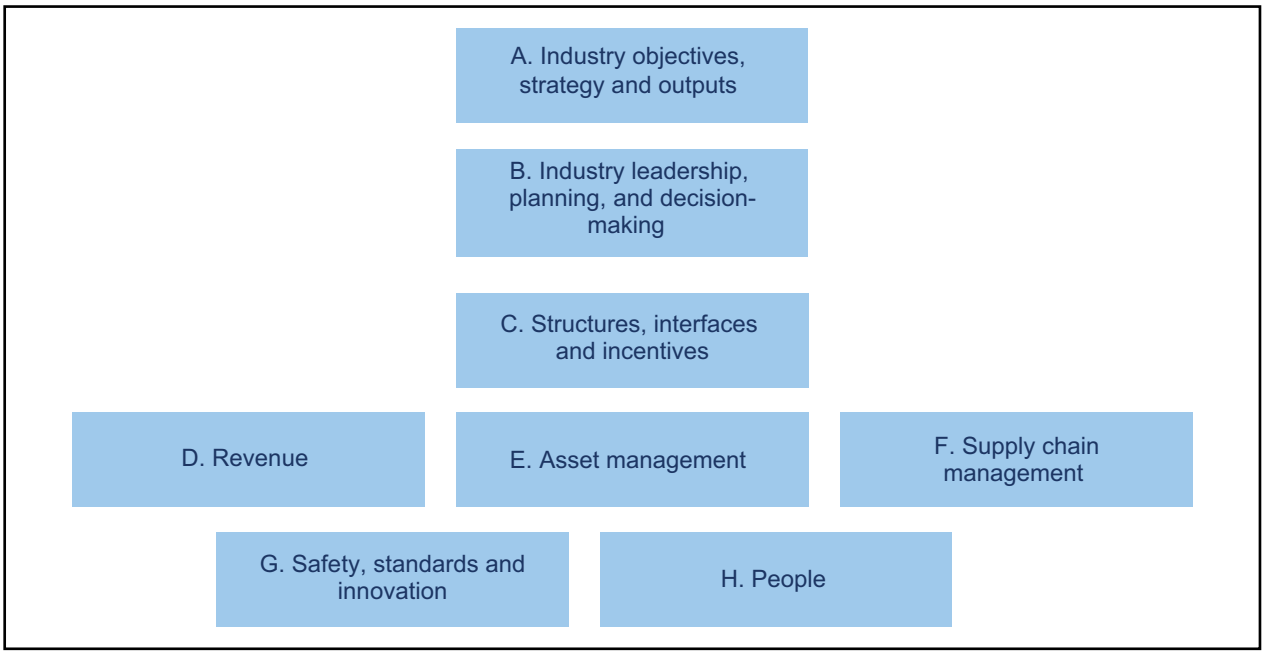
5. The work will divide into a Scoping Study and a detailed report, the former to be completed by the end of March 2010.

The Study commenced in February 2010 with preliminary work on the Scoping Study, which was completed in March and published in June 2010. An Interim Submission to the Secretary of State was completed in September 2010 and published in December.

2.2 Key areas for the Study

The Scoping Study identified many activities throughout the industry that merited investigation. For the purposes of managing the Study and providing focus, these were grouped into eight broad Areas (see Figure 2.1). The Interim Submission identified a number of additional issues that are addressed later in this report.

Figure 2.1: Eight Areas identified by the Scoping Study for investigation



These Areas were designed to address the key factors driving costs in the rail industry, recognising that they have strong interdependencies. They were defined as follows:

- Area A: Industry objectives, strategy and outputs – addressing clarity of specification, requirements and overall balance of funding sources.
- Area B: Industry leadership, planning and decision-making – addressing industry leadership, structures and the processes of making planning and investment decisions.
- Area C: Structures, interfaces and incentives – addressing how industry structural issues and wider institutional and contractual frameworks impact upon cost-effectiveness.
- Area D: Revenue – addressing the effective exploitation of rail revenue sources, including fares and revenue protection, and management of the property portfolio.
- Area E: Asset management – addressing the approach to the management of fixed and moving assets, and aligning with best-practice across national boundaries and different industries.
- Area F: Supply chain management – addressing the industry's management of its suppliers and driving efficiency through more effective procurement.
- Area G: Safety, standards and innovation – addressing how to streamline, reduce duplication and bureaucracy, and encourage greater innovation, while maintaining safety standards.
- Area H: People – addressing best-practice in human resource management and the extent to which efficiency and value for money can be delivered.

2.3 Methodology

2.3.1 Analysis by project teams and leaders

Given the complexities of the subject matter, and the short timescales necessary, a number of methodological approaches ran in parallel.

The project's core resource was full-time staff seconded from the DfT and the ORR, supplemented by a number of external personnel including an Area leader and the Chair and Deputy Chair of the Study.

There was a designated leader for each Area of the Study. Their role has been to manage and co-ordinate the analysis and research identified below, to ensure that clear, consistently set out outcomes are developed, to support the Chair and Deputy Chair, and to provide leadership and guidance to the Study.

2.3.2 Consultancy and benchmarking studies

Recognising time constraints and the importance of ensuring a strong, quantified evidence base, the Study commissioned several consultants to support the process. Consultancy support assisted in ensuring a participative approach with the rail industry and deepened the analytical framework.

Benchmarking reports were completed across a number of the Areas of Study and have built on the analysis carried out by the ORR, the DfT and the wider industry in previous years. The aim has been to identify and provide a strong evidence base for the recommendations being put forward.

International benchmarking has involved selective comparison of the GB rail industry with similar railways in France, the Netherlands, Germany, Sweden, Denmark, the USA, Hong Kong and Australia. It was recognised that benchmarks do not necessarily give the full picture, but they yield many useful indicators.

The benchmarking identified best-practice and emerging issues in areas such as:

- infrastructure management;
- train operating company costs;
- industry overhead costs;
- human resource management;
- rolling stock and infrastructure whole-life asset management;
- train operations;
- industry leadership and planning; and
- industry structure and financing.

The Study also considered other UK industries for benchmarking purposes, including water, aviation, oil and gas, and electricity.

2.3.3 Desktop research

Much of the evidence base was gathered by the Study, working in collaboration with a number of organisations across the industry.

A range of specific case studies was commissioned and these case studies provide supporting evidence.

One of the key areas of desktop research was the commissioning of a "Should Cost" Study for the industry, based upon analysis of historic trends in order to estimate where the cost base of the industry "should" have got to in normal circumstances since privatisation. This top-down approach was based upon starting from today's cost base and removing identified inefficiency to complement the Study's bottom-up approach in other Areas of the Study.

Wherever possible the Study attempted to source research and reports previously commissioned by the industry, in order to expedite their work. The Study has built upon this work and, where required, commissioned further work packages from consultants to add to previous studies.

2.3.4 Stakeholder Groups

All Areas of the Study were supported by dedicated Stakeholder Groups, which met to review emerging evidence, to review work commissioned by the Study, and to provide guidance and insight on a regular basis. These groups had representation from senior managers and experts across the rail sector, including train operators, NR, Government and the supply industry, and the Study is most grateful for their input and support.

The Stakeholder Groups assisted in the provision of data and in validating the approaches taken by the Study. They were well supported within the rail industry, and enabled invaluable accumulated expertise to be deployed within the work of the Study.

The Stakeholder Groups assisted the Study to position emerging findings to have the best prospect of securing "buy-in" from the industry, Government and the ORR.

2.3.5 Workshops

A first workshop was held in March 2010 in order to assist the Study in formulating areas of Study for inclusion into the Scoping Report delivered to the Secretary of State.

A second stakeholder workshop was held on 19 July 2010 to report on the progress of the Study, to present emerging evidence and to secure understanding from the industry with regard to the process being adopted. It was attended by over 80 senior representatives of the industry, who heard a keynote speech from the Secretary of State, and endorsed the approach adopted by the Study.

A third and final stakeholder workshop was held on 9 March 2011 to allow the Study to present emerging conclusions and provide industry with early indications of the Study's approach to securing better value from the rail industry. Keynote speeches were given by the Secretary of State, David Higgins (NR), Tom Smith (ATOC) and Bill Emery (ORR).

3. Cost and revenue structure of the GB rail industry

3.1 Rail industry outputs

3.1.1 Introduction

The following sections set out what the railway has delivered and the implications for efficiency and value for money. They focus on the passenger railway as the principal recipient of Government support, although the freight sector is taken into account where its impact is material. Most of the analysis covers the period 1996/97 to 2009/10.[1]

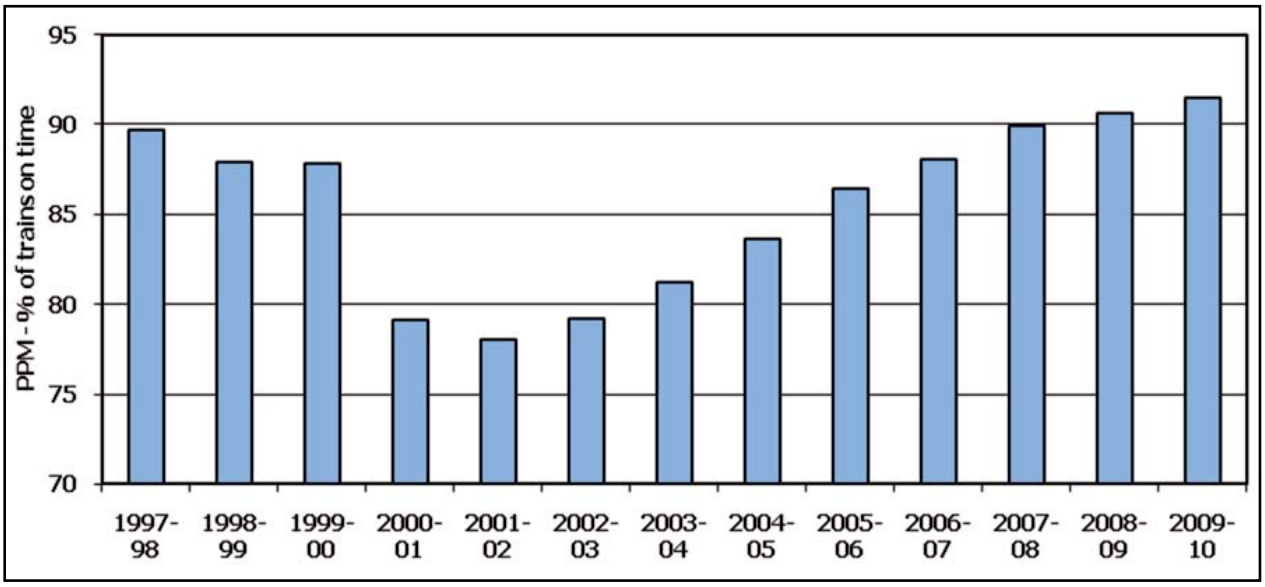
3.1.2 Delivering more

In many ways, the arrangements put in place at privatisation have worked well. Rail's overall performance has improved in terms of delivering greater capacity and accommodating a substantial increase in demand:

- there has been a 57% increase in passenger journeys to 1.3bn per year;
- there has been a 26% increase in freight moved to 19bn net tonne km per year;[2]
- there has been a significant increase in capacity through the delivery of new trains (since 2000/01 the average age of rolling stock has fallen by 23%[3]) and infrastructure enhancements such as the West Coast Main Line upgrade. This has contributed towards a 28% increase in passenger train-km since 1996/97;[4]
- railway safety is at an all time high, it is significantly better than road transport and is now comparable with air transport;[5]
- train reliability has improved significantly since the Hatfield accident in 2000[6] (see Figure 3.1 below).

1 This period has been used as it maximises the use of consistent time series data.
2 If the period up to the recession is taken (1996/97 to 2006/07) then the increase would be 45%.
3 Table 6.1 in Office of Rail Regulation (2010) *National Rail Trends 2009–10 Yearbook*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/nrt-yearbook-2009-10.pdf.
4 Train mileage data taken from NR's PALADIN system.
5 Table 1.7 in Department for Transport (2009) *Transport Statistics Great Britain 2009*. London: DfT. This document can be accessed at http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/pgr/statistics/datatablespublications/tsgb/2009edition/sectiononemodalcomparisons.pdf.
6 Table 2.1 in Office of Rail Regulation (2009) *National Rail Trends 2008–09 Yearbook*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/YEARBOOK0809-v22.pdf.

Figure 3.1: Train reliability (public performance measure – percentage of trains on time)



Source: *National Rail Trends 2008–09 Yearbook*.

Note: Public Performance Measure (PPM) data are not available for 1996/97.

- and customer satisfaction has improved, with 83% of passengers now satisfied with rail services, and with significant improvements since surveys began in 2004. The greatest improvements have occurred in service reliability (Figure 3.1) and train quality factors such as cleanliness and seating. However, satisfaction in some other areas is little changed with, in particular, only 48% of passengers satisfied with the value for money of their tickets.[7]

3.2 Revenue

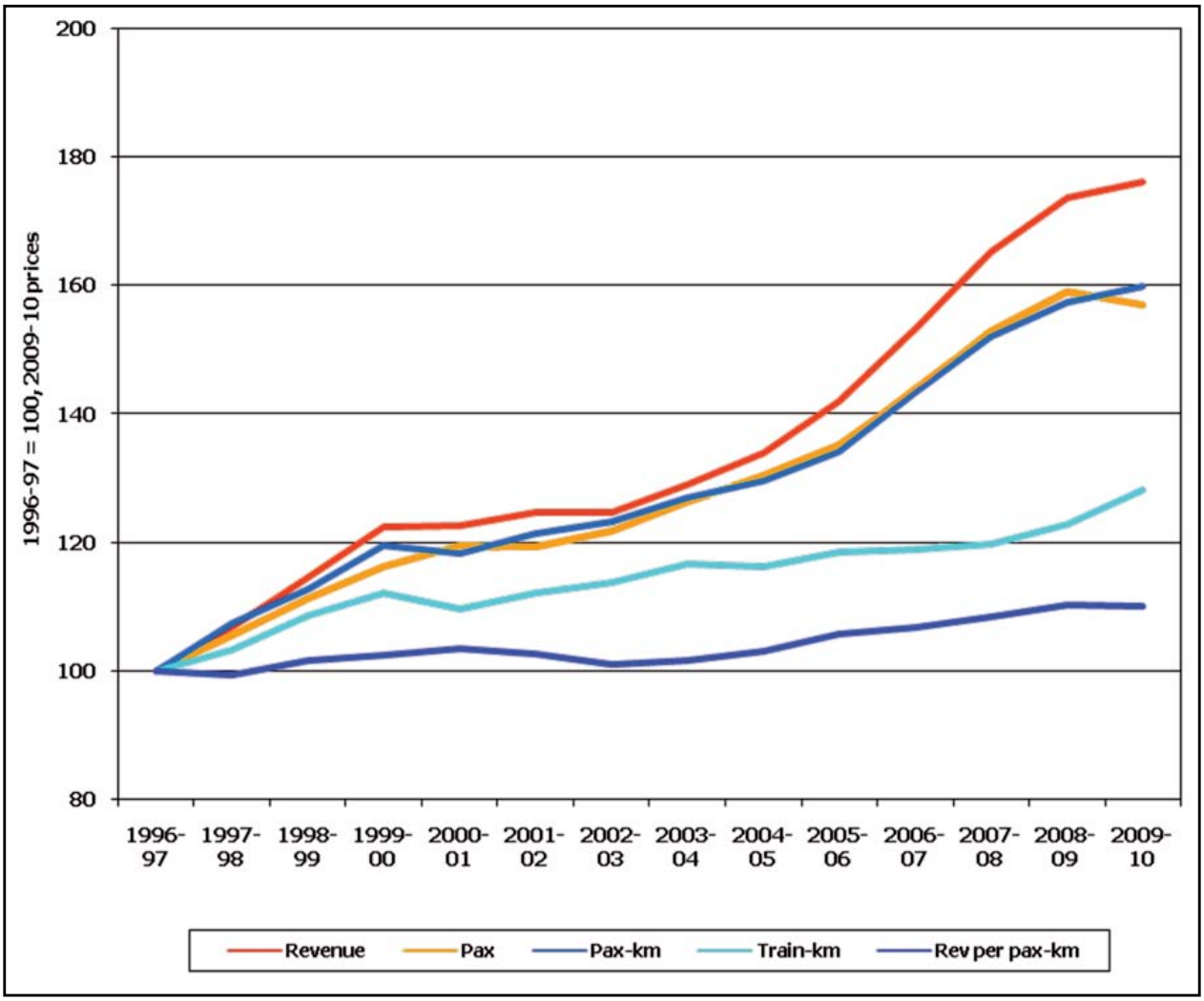
3.2.1 Rail passenger revenue

As can be seen from Figure 3.2, the increase in railway capacity, coinciding with a period of strong economic growth and increasing congestion on other modes, has led to significant increases in rail patronage and revenues. Since 1996/97 passenger rail revenue has increased by £2.7bn or 76% to £6.2bn per year[8] (all figures 2009/10 prices). This has been driven by the 57% increase in rail patronage and, in recent years, an increase in average yields following the move to a Retail Prices Index (RPI) + 1% fares regulation.

7 *National Passenger Survey Spring 2010* and *Spring 2004, Passenger Focus*. These documents can be accessed at www.passengerfocus.org.uk/research/nps/content.asp?dsid=496.

8 Table 1.3b in Office of Rail Regulation (2009) *National Rail Trends 2008–09 Yearbook*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/YEARBOOK0809-v22.pdf. Figures have been deflated using the Treasury GDP deflator, see www.hm-treasury.gov.uk/d/gdp_deflators.xls.

Figure 3.2: Index of passenger revenue, patronage, passenger-km and average yield per passenger-km

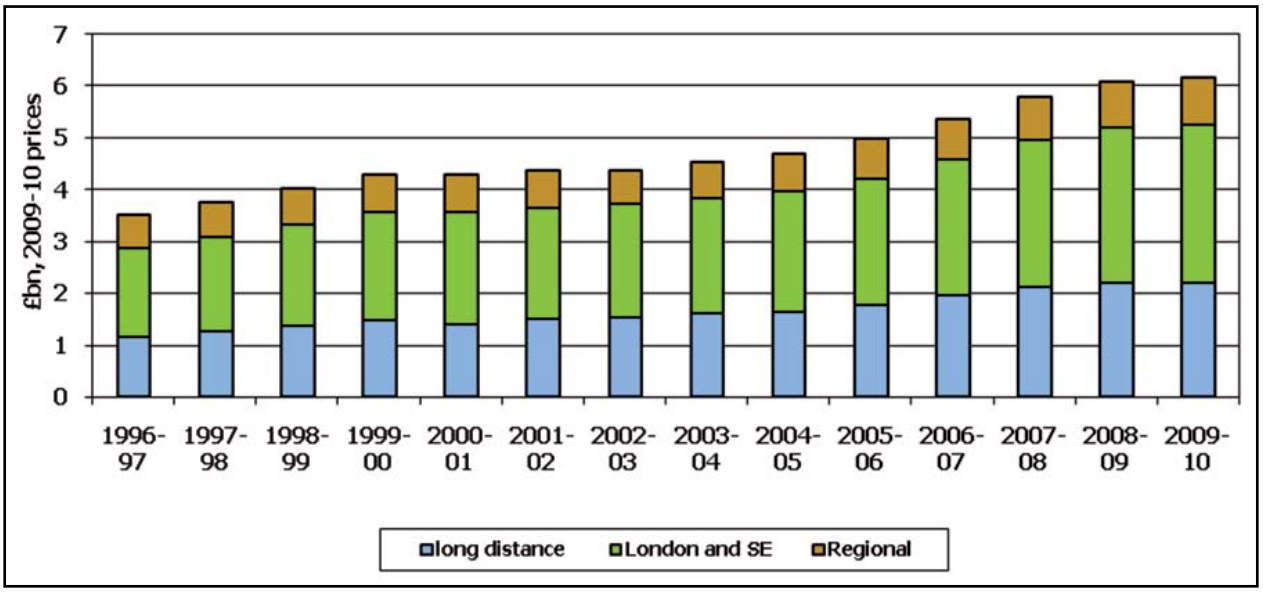


Source: *National Rail Trends 2009–10 Yearbook* and PALADIN data.

3.2.2 Breakdown of rail passenger revenue

Revenue growth has been strongest in the long distance sector, which accounted for 36% of rail passenger revenue, compared with 49% for London and South East operators and 15% for regional operators (Figure 3.3).

Figure 3.3: Passenger revenue by sector



Source: *National Rail Trends Yearbook 2009–10*.

Some 35% of passenger revenue is from regulated tickets, the majority of which is season tickets in London and the South East.

3.2.3 Other rail industry revenue

In addition to passenger revenue of £6.2bn in 2009/10 there was also rail freight revenue of £0.8bn and other non-farebox Train Operating Company (TOC) revenue of £0.6bn, of which car parking made up £0.1bn, commission £0.1bn, property £0.1bn and train maintenance £0.1bn. NR also received £0.1bn of income from property and passenger open access operations.

3.3 Overall cost structure

Whole rail industry costs were around **£12.7bn** in 2009/10, a little under half of which was accounted for by NR.

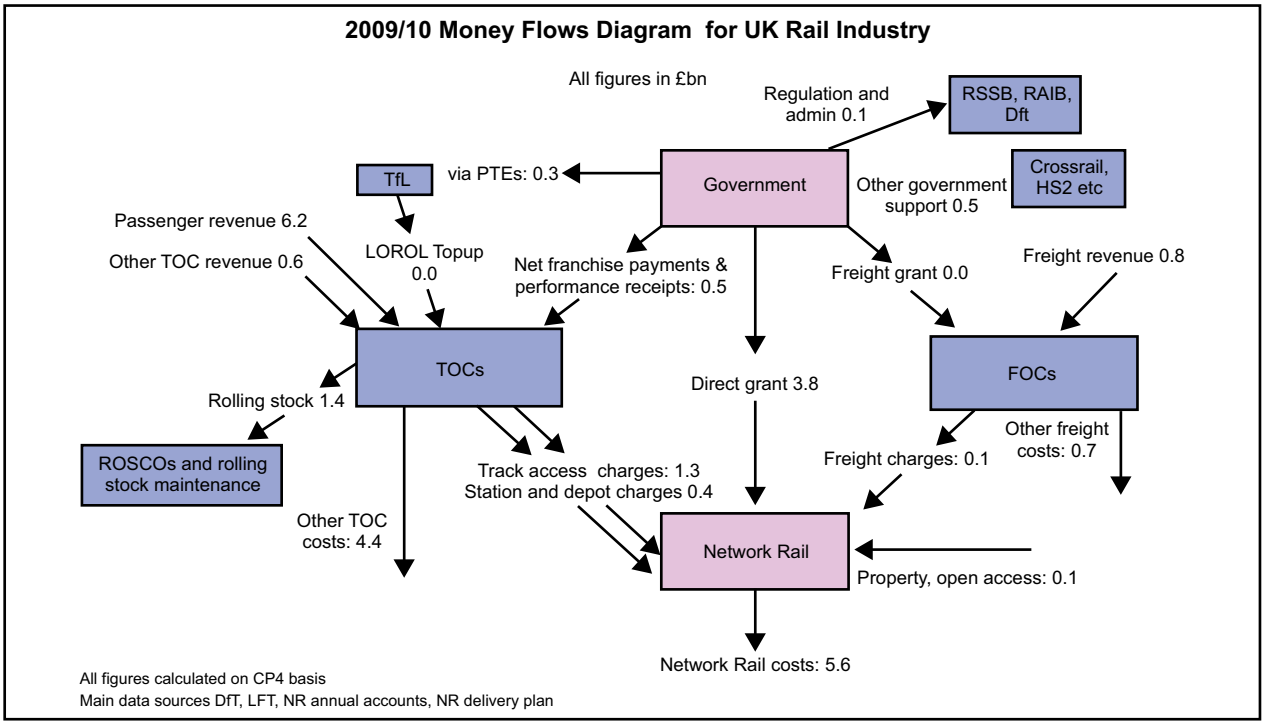
Total money flows (excluding payments to NR for track and station access) across the industry in 2009/10 are shown in Table 3.1.

Table 3.1: Total money flows in GB rail 2009/10

Organisation	Costs £bn 2009/10
NR	5.6[9]
Franchised train operators (own costs)	4.4
Rolling stock companies (ROSCOs) charges	1.4
Freight operators	0.7
Projects	0.5
Regulation and administration	0.1
Total	12.7

NR is largely funded by a combination of access charges from train operators and direct government grant (in lieu of access charges). In 2009/10 about two-thirds of NR's revenue was through direct government Network Grant (although this proportion tends to change annually). NR also receives a small amount of income (£0.1bn) from property rental and sales (Figure 3.4).

Figure 3.4: Rail industry money flows 2009/10 (£bn)



Franchised train operators incurred net costs (excluding NR access charges, but including ROSCO charges) of £5.8bn in 2009/10. Franchised operations have, over recent years, generated a small surplus, i.e. passenger revenue has been greater than net costs, although the picture is very

9 NR costs of £5.6bn for 2009/10 have been taken as the gross revenue requirement from regulatory accounts, less electric current for traction costs that are allocated to TOCs.

different for long distance and London and South East operators (which tend to generate surpluses) and regional operations where revenues fall well below costs. Net franchise payments from Government to franchised train operators were £0.5bn in 2009/10, but would have been much higher if it were not for the fact that direct government grant provides a high proportion of NR's revenue.

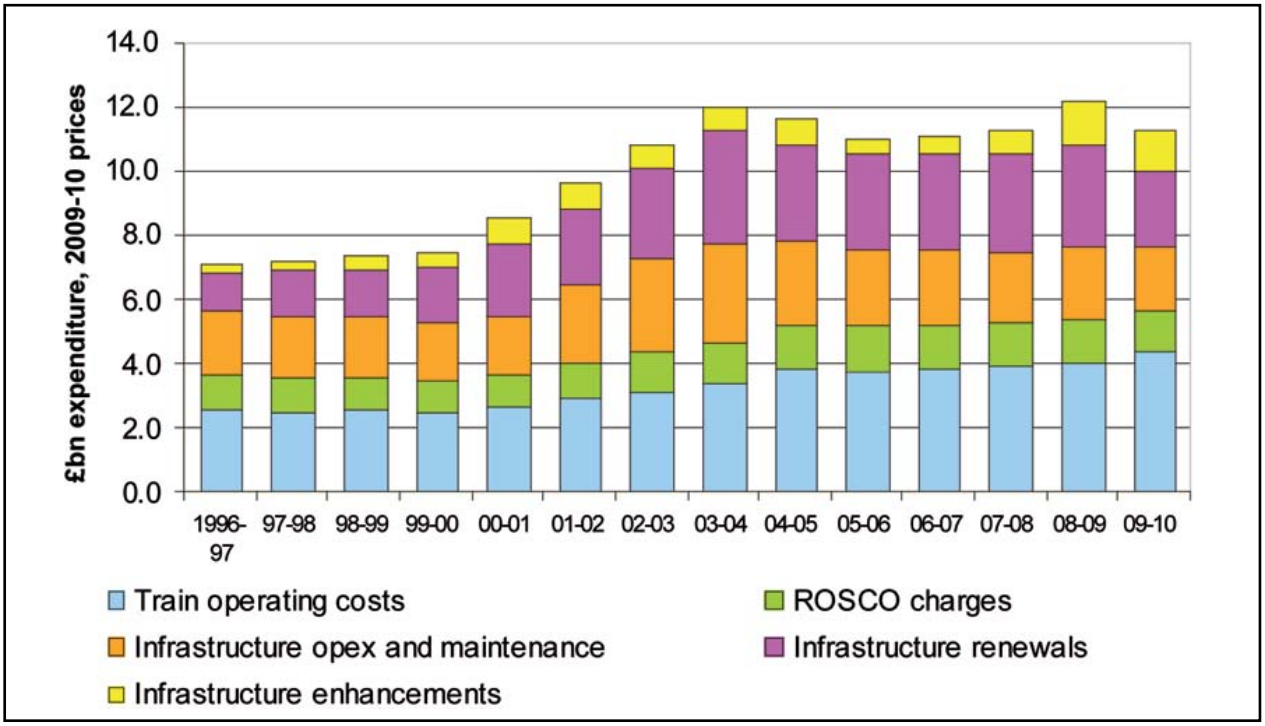
Freight traffic makes up a small but important part of the railway. Freight traffic accounts for 7% of traffic on the network (as measured by train-km). It operates commercially and only receives limited grant support from Government to encourage modal shift from road to rail. Apart from some small exceptions, it pays only NR's variable costs and does not contribute towards the fixed costs of the railway, except on freight-only lines. Open access passenger operators, under EU Directives, also pay only variable costs for track access.

Rolling stock companies (ROSCOs) provide rolling stock and rolling stock maintenance services to both passenger and freight operators. They receive revenue of around £1.4bn, 85% of which is related to lease rentals. ROSCO profit before tax is around £0.2bn.

3.3.1 Increasing costs of the rail sector

The post-privatisation period has seen a significant increase in passenger rail expenditure, only part of which can be directly attributed to the increase in outputs. Since 1996/97 passenger rail industry expenditure has increased by £4bn or 60% to over £11bn (2009/10 prices) as shown in Figure 3.5.

Figure 3.5: Passenger rail industry expenditure 1996/97 to 2009/10



Source: NR regulatory accounts.

Note: Train operating costs exclude access charges apart from traction electricity.

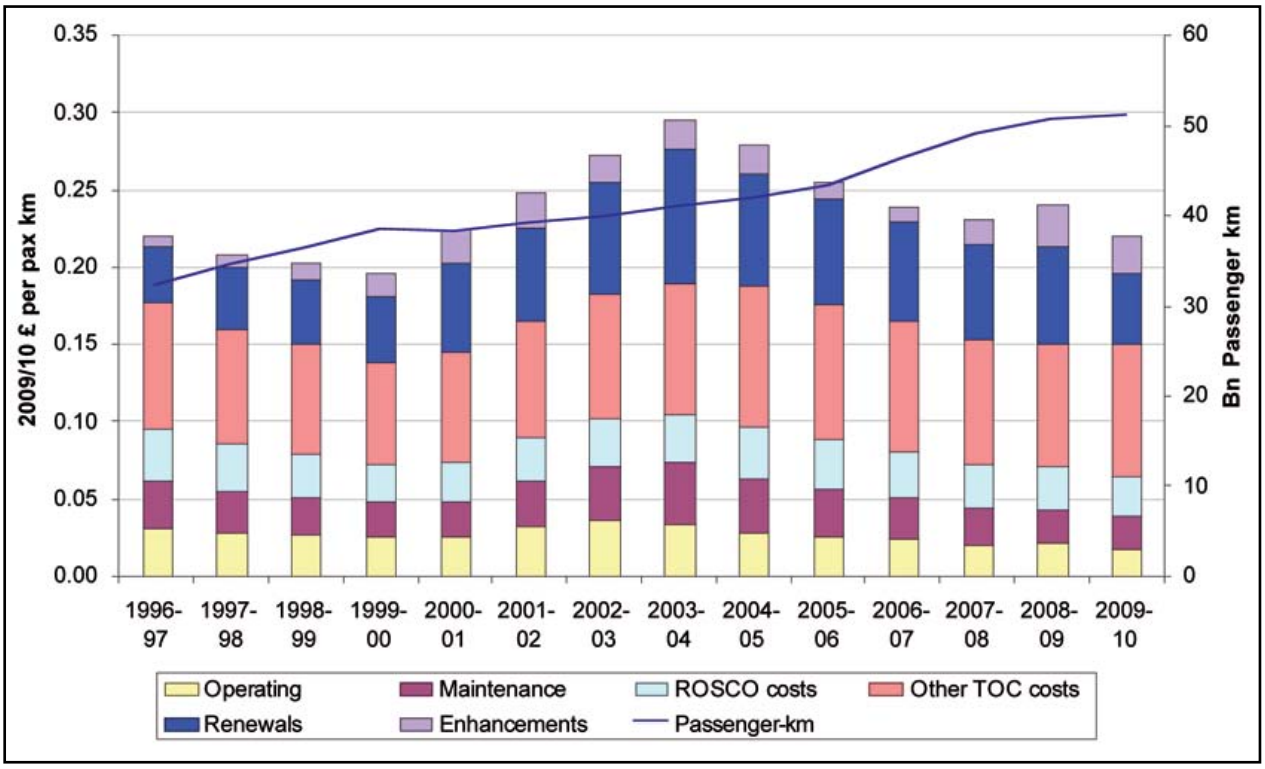
The most noticeable changes in expenditure were the rise in costs after the Hatfield accident in 2000, and the subsequent recovery – due in particular to NR largely achieving its target of a 30% cost reduction in CP3. The principal changes in expenditure occurred in the following areas:

- Train operating costs, where costs have increased by £1.7bn, around £0.8bn of which can be attributed to the increase in train-km. Most of the remaining cost increase can be attributed to an increase in staff costs, at least part of which may be related to increased outputs – for example in terms of station staffing.
- Rolling stock charges, which have increased by £0.3bn, reflecting the increase in train-km and number of vehicles leased.
- NR operating and maintenance expenditure, which is now the same as the level in 1996/97. These costs peaked in 2003/04 and have now fallen by £1.1bn; a large part of the post-Hatfield cost increase has now been removed, with NR largely achieving its target of a 30% cost reduction during CP3.
- Renewals expenditure is currently £1.1bn higher than 1996/97, approximately £0.7bn of which is related to increased renewals volumes. Again there has been a reduction in costs from the post-Hatfield peak, with renewals unit costs falling by 29% from 2004/05,[10] although efficiency improvements in track, in particular, have been difficult to achieve.
- Infrastructure enhancement expenditure has increased by £1.0bn, part of which relates to major projects including Thameslink and Airdrie to Bathgate.

Since 1996/97, although rail passenger-km have increased by 59%, there has been little improvement in the cost per passenger-km. Figure 3.6 shows industry expenditure per passenger-km and that, while there have been reductions of between 1% and 3% per year in train operating costs and infrastructure operating and maintenance expenditure per passenger-km, these have been largely offset by the increases in renewals and enhancement expenditure highlighted above.

10 Office of Rail Regulation (2009) *Annual Efficiency and Finance Assessment of Network Rail 2008–09*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/nr_efficiency_assessment_0910.pdf.

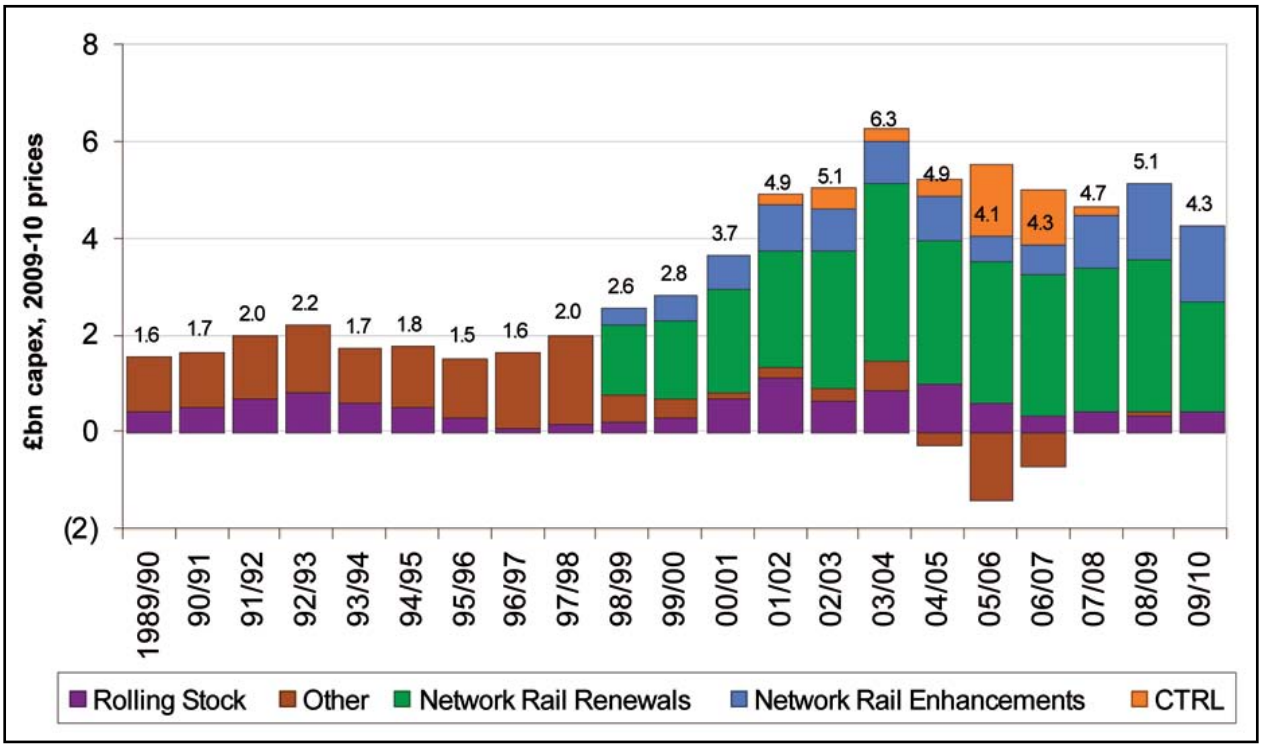
Figure 3.6: Industry expenditure per passenger-km (2009/10 prices)



Source: NR regulatory accounts, National Rail Trends.

Accordingly, it is informative to look at the build up of rail industry capital costs (capex) and operating costs (opex) separately over time. Figure 3.7 shows the build up in industry capex over time. This shows that industry capex increases have been driven by an increase in NR renewals and enhancement expenditure, particularly in the period 2001/01 to 2003/04, when capex peaked at £6.3bn in 2003/04. Since then capex has fallen to £4.3bn in 2009/10. This reduction is driven by a £1.4bn annual reduction in NR renewals.

Figure 3.7: Rail industry capital expenditure in constant prices (post-accounting adjustments)

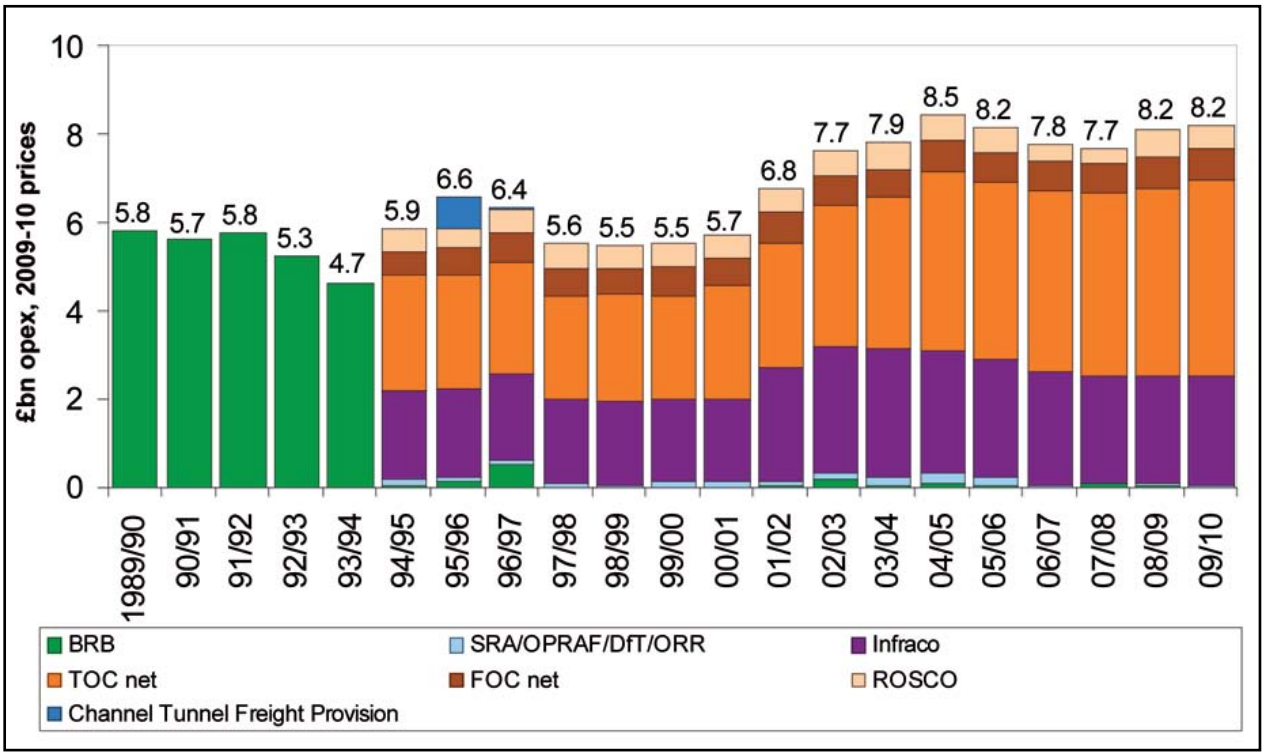


Source: National Rail Trends, Network Rail regulatory accounts.

Note: The "other" capital expenditure is a balancing item between rail industry investment as it appears in National Rail Trends and the actual capital expenditure from the NR Accounts. For 2004/05 to 2006/07 the actual capital expenditure was higher than National Rail Trends figures.

Figure 3.8 shows industry opex, which has been rising steadily across the period, driven by the increase in train operating costs which reached £4.4bn in 2009/10.

Figure 3.8: Rail industry operating costs in constant prices (pre-depreciation, post-accounting adjustments)



Source: National Rail Trends, DfT statutory accounts, TOC/FOC/ROSCO statutory accounts.

3.4 The call on the taxpayer

3.4.1 Historical expenditure and government support

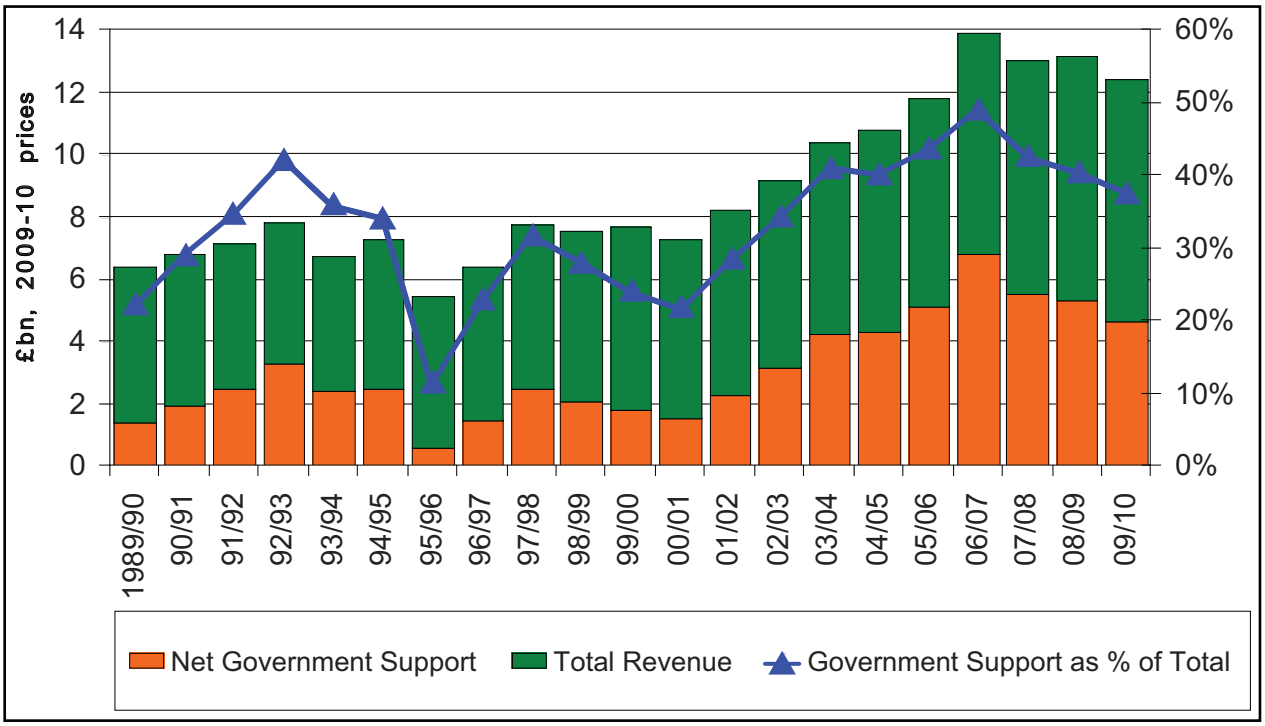
A net increase of £1.7bn in Government subsidy occurred between 1996/97 and 2009/10.[11] Since 1996/97 – despite increases in passenger revenue of £2.7bn – the principal drivers have been increases in:

- train operating costs (including ROSCO charges) of £2.0bn; and
- NR's net revenue requirement of £2.7bn.

Figure 3.9 shows net Governmental support peaking in 2006/07 at £6.8bn, 49% of the combined total of Government support and (passenger and freight) revenue. Over recent years, net Government support has been falling, although it is still significant at £4.6bn, 37% of the combined total.

11 Source: National Rail Trends. This excludes other elements of Government support, including receipts from privatisation and contributions towards enhancement schemes such as Crossrail.

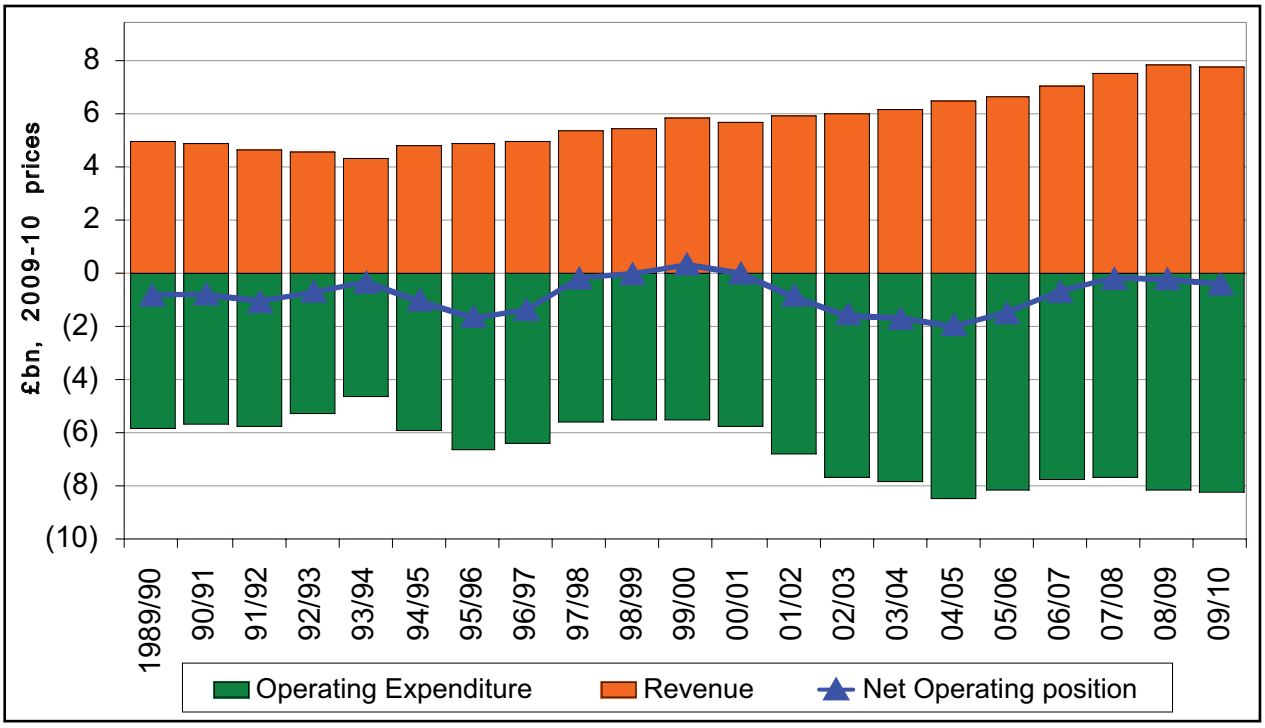
Figure 3.9: Industry revenues and subsidy 1989/90 to 2009/10



Source: National Rail Trends, DfT statutory accounts, TOC statutory accounts.

To understand better the drivers of subsidy growth, the Study has examined separately the net industry operating position, which only includes operating expenditure and revenues (Figure 3.10) and the net industry cash position, which also includes capital expenditure (Figure 3.11). These figures show that the industry is currently almost covering its operating expenditure, with the net deficit currently £0.5bn, improving from a net deficit of £2.0bn in 2004/05.

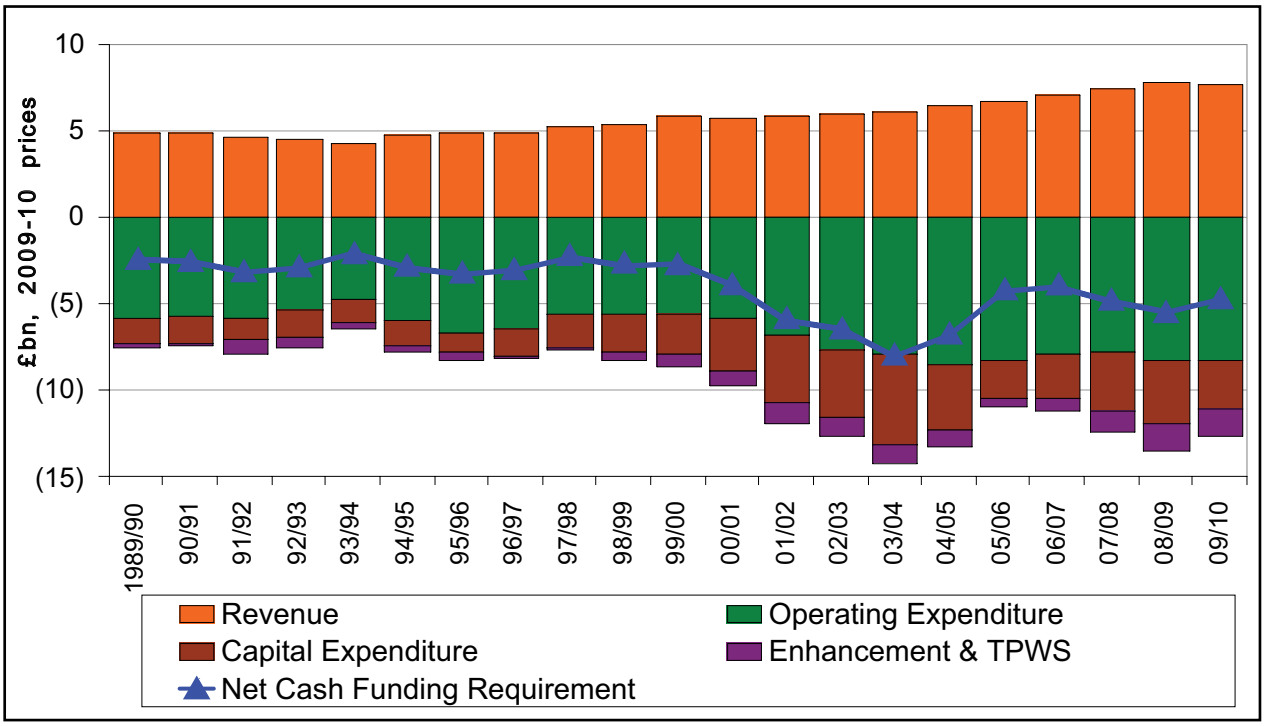
Figure 3.10: Industry net operating position in constant prices



Source: National Rail Trends, DfT statutory accounts, TOC statutory accounts.

There is, however, a much more significant deficit in the industry's overall cash position, driven by the fact that there is no operating margin to pay for the substantial capital expenditure and enhancements being incurred.

Figure 3.11: Industry cash position in constant prices



Source: National Rail Trends, Network Rail statutory accounts, DfT statutory accounts, TOC statutory accounts.

3.4.2 Impact of the Regulatory Asset Base

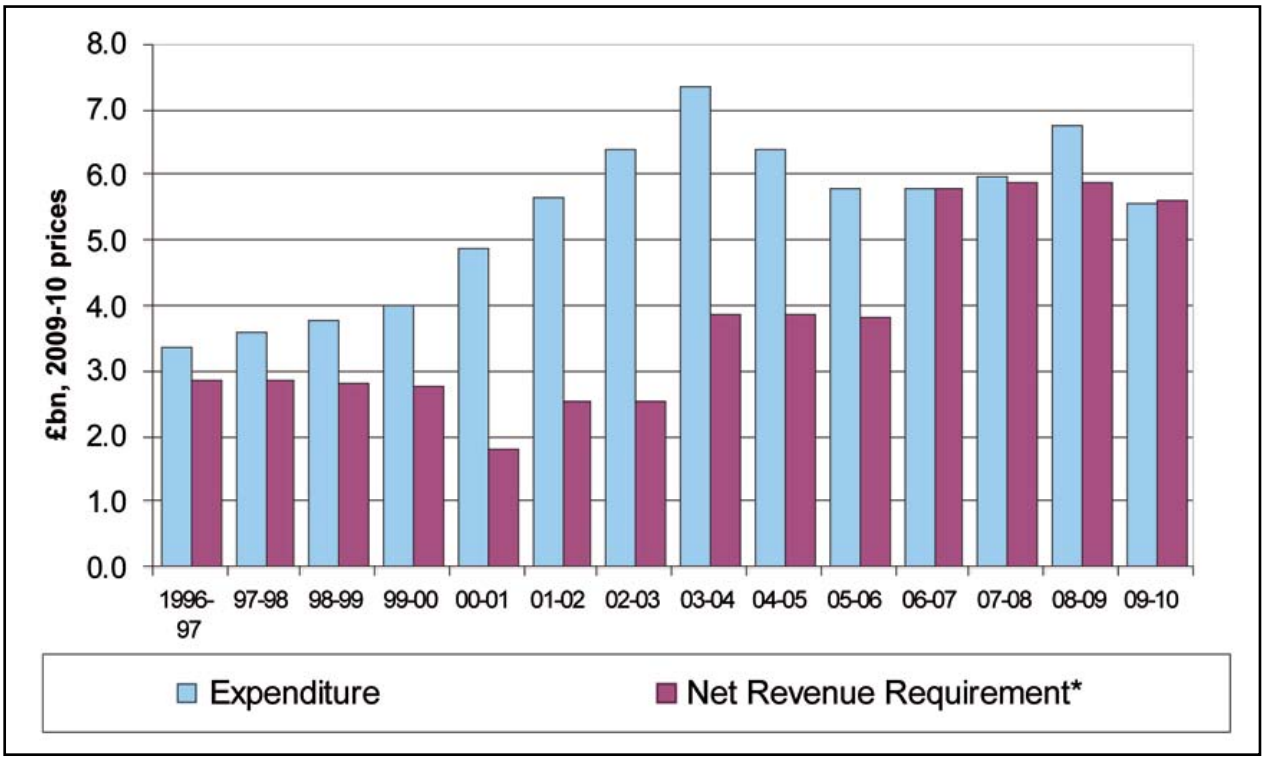
Total industry cash expenditure does not however feed directly into Government subsidy requirements due in particular to the way NR is financed. NR is funded through a conventional regulatory approach (the "building block" approach) where renewals and enhancement expenditure is mostly capitalised[12] and added to the Regulatory Asset Base (RAB). This is paid for through an amortisation allowance and an allowed return on the RAB.

These mechanisms allow NR to finance its debt and the renewal of its infrastructure assets. Funding of capital expenditure in the current year is spread over future years, ensuring that future users of the railway pay for infrastructure improvements from which they are benefiting. NR's revenue requirement is the total of operating and maintenance expenditure, amortisation and return on the RAB.

NR (and Railtrack's) expenditure has been higher than its revenue requirement for most of the post-privatisation period, as shown in Figure 3.12.

12 The current regulatory settlement provides for NR to pay for some renewals and enhancements through the operation of the ring-fenced funds within the allowed return. Additionally it pays a fee to the Secretary of State (the Financial Indemnity Mechanism (FIM) fee) as part of the financial arrangements to support the debt burden.

Figure 3.12: NR expenditure and revenue requirement

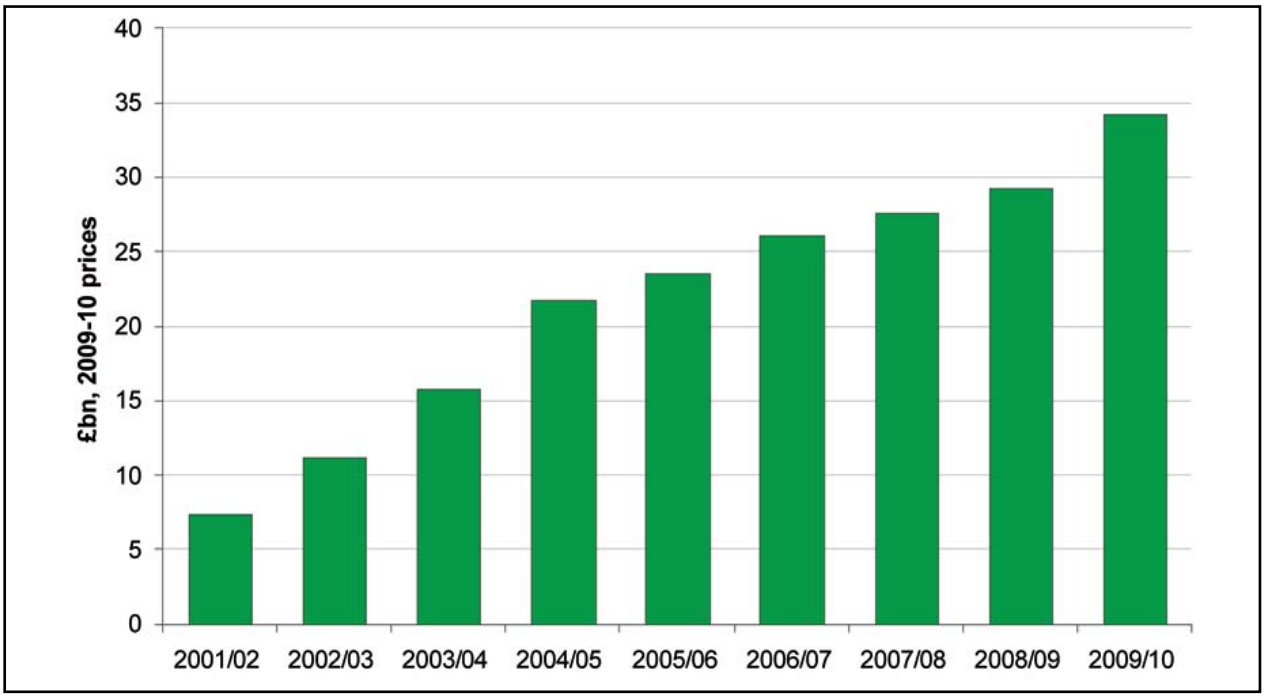


Source: NR regulatory accounts.

Note: NR expenditure includes operating, maintenance, renewal and enhancement expenditure. Revenue requirement derived from income.

The particularly high level of expenditure since 2000/01, principally addressing the renewals backlog, has translated into significant increases in the RAB, with the RAB standing at £35.7bn at March 2010, an increase of £29bn since 2001/02 when the building block approach was introduced. In Control Period 3 (CP3) (2004–09) the increased level of post-Hatfield expenditure, financed largely through raising additional debt between 2004 and 2006, increased the RAB substantially. Figure 3.13 shows the increasing size of the RAB since 2001/02.

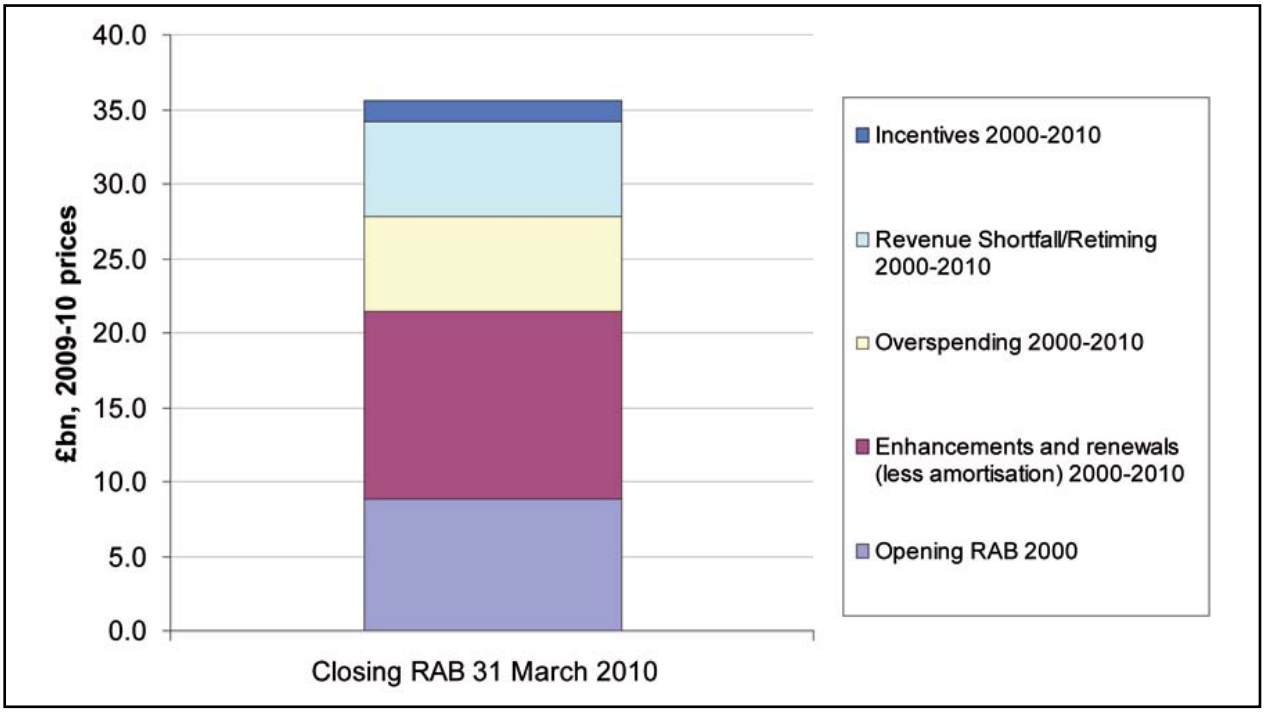
Figure 3.13: Opening RAB for NR



Source: NR regulatory accounts; figures show opening RAB.

The increase in the RAB is not all accounted for by normal capital expenditure, with around 30% of the RAB increase reflecting other financial adjustments. These adjustments include the addition of the post-Hatfield overspend and the retiming of revenue grants, where, following a request from the Strategic Rail Authority (SRA), in 2004/05 and 2005/06 some of NR's revenue requirement was added to the RAB rather than paid in the year of the revenue requirement (Figure 3.14).

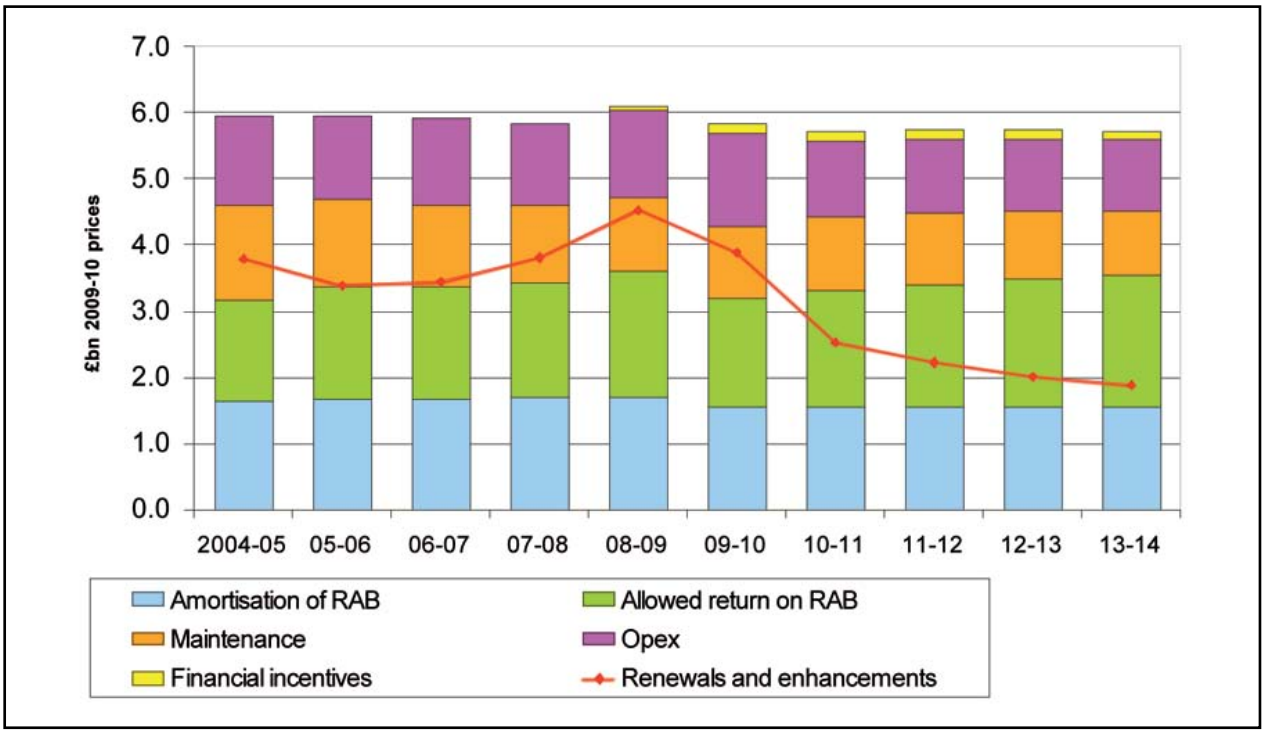
Figure 3.14: Structure of the RAB at 31 March 2010



Source: NR regulatory accounts.

The increasing level of NR's RAB, and the debt that underpins it, results in a significant base cost for the rail network going forward. The high level of RAB-funded enhancement and renewal expenditure planned between 2009 and 2014 is projected to increase the RAB to £42bn.[13] This means that, even if NR meets the challenging efficiency targets across its operations and maintenance activities set by the ORR, its revenue requirement will be only £510m lower in 2013/14 than in 2009/10, with 62% (compared with 58% in 2009/10) of NR's revenue requirement accounted for through amortisation and the allowed return on the RAB (Figure 3.15). Accordingly, improved NR efficiency on its own will not address the cost challenges facing the industry.

Figure 3.15: Historic and forecast NR revenue requirement



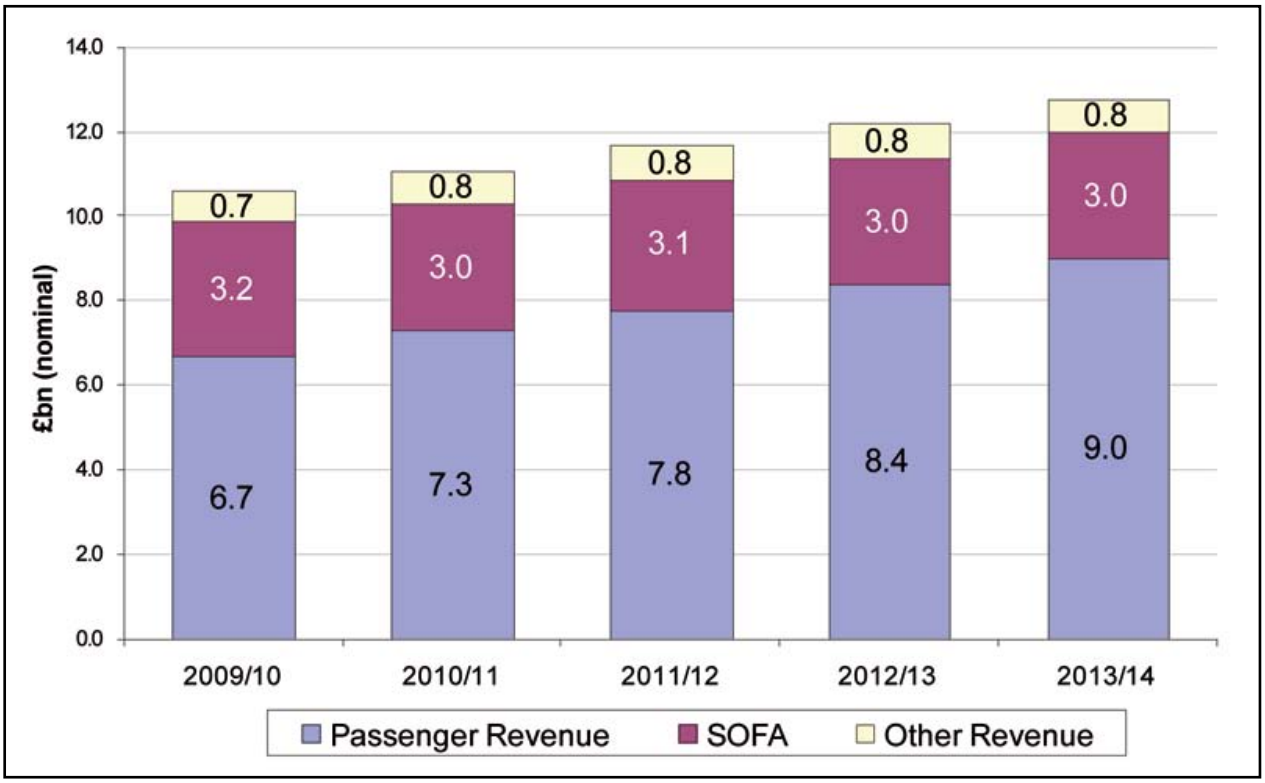
Source: Determination of NR's outputs and funding for 2009–14, October 2008, Office of Rail Regulation and NR regulatory accounts 2005 to 2009.

3.4.3 Comparison of forecasts

The 2007 White Paper *Delivering a Sustainable Railway* set out the Government's objective to rebalance funding for the rail industry in England and Wales by 2014. At the time of its publication, it was projected that in 2009/10 over 50% of costs would be recovered from users, increasing to 70% by 2013/14 (Figure 3.16).

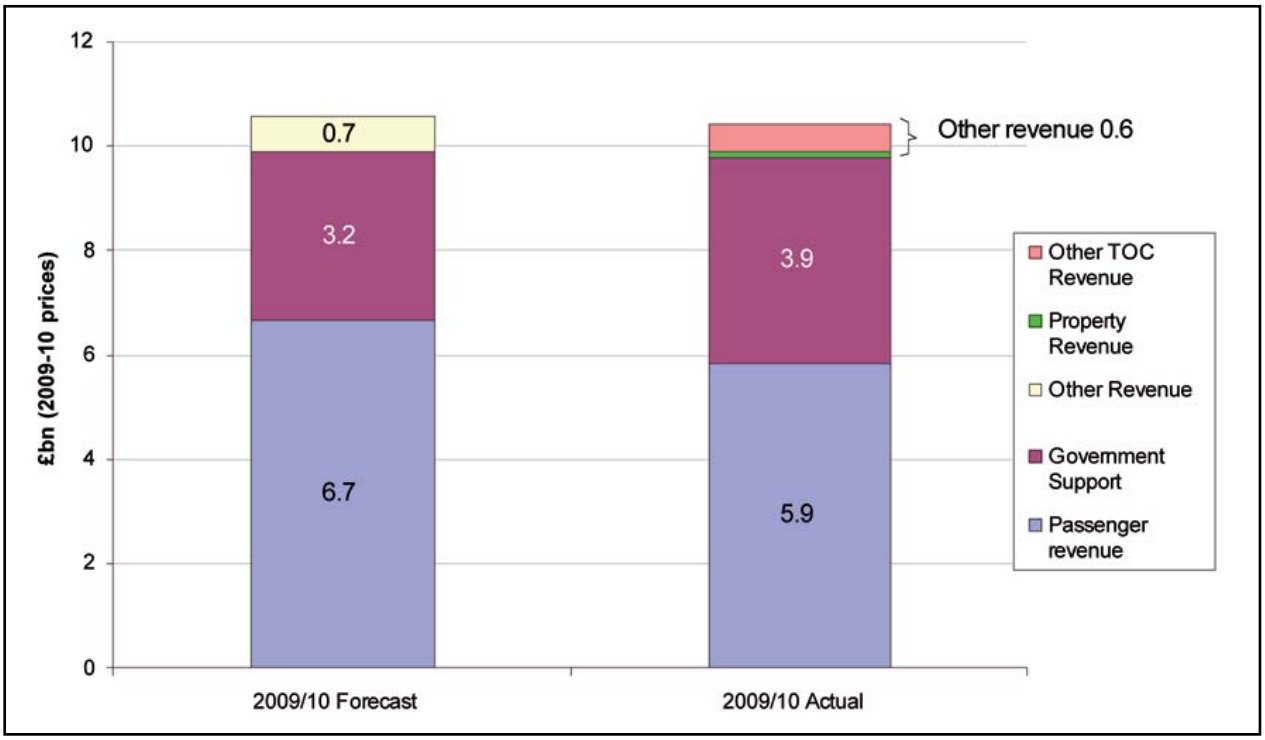
13 Office of Rail Regulation (2008) *Periodic Review 2008: Determination of NR's outputs and funding for 2009–14 – Regulatory asset base and net debt assumptions*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-NRs_op_fund_09-14.pdf.

Figure 3.16: 2007 White Paper forecast funding from passenger revenue and Statement of Funds Available (SoFA) (England and Wales only)



In 2009/10 passenger revenues were below those forecast in the 2007 White Paper due to the pause in revenue growth caused by difficult trading conditions, primarily due to the UK recession. This has resulted in higher support from the Government to TOCs to compensate for falling passenger revenues – with the DfT paying £290m in 2009/10 in revenue support to franchised operators, up from £60m in 2008/09. This comparison highlights the difficulties in forecasting rail passenger revenue and Government support (Figure 3.17).

Figure 3.17: 2009/10 actual versus forecast funding from passenger revenue and Government support (DfT only)



Unless there is significant and rapid recovery in revenue growth, achievement of the 2013/14 forecasts will be increasingly challenging and the level of user cost coverage may not be greatly different from current levels.

3.5 Conclusion

The UK rail industry has demonstrated strong growth in both passenger and freight traffic in the last decade which has increased passenger and other revenue in the industry. However, industry costs have also increased, and unit costs per passenger-km in 2009/10 show little or no improvement compared to those in 1996/97. With the industry almost covering its operating costs, but significant capital costs being incurred, this means that on current trends the future cost to Government is likely to increase and could well become unsustainable. Therefore there is a need to look radically at the way the industry operates in order to find ways of delivering improved value.

4. Benchmarking and cost savings

4.1 Benchmarking

Benchmarking indicates that GB railways costs are high compared with other railways and sectors. The following section summarises the evidence from other studies on GB rail costs and the work that the Study has commissioned on international whole-industry cost benchmarking from consultants Civity.

4.1.1 Infrastructure costs benchmarking from other sources

The Office of Rail Regulation's work at the 2008 periodic review

A range of top-down benchmarking of infrastructure maintenance and renewal costs (summarised in Table 4.1) was undertaken as part of the last periodic review of Network Rail (NR):[14]

- The Office of Rail Regulation (ORR), working with ITS Leeds, undertook econometric international benchmarking;
- BSL (commissioned by NR) assessed the efficiency gap from a process/managerial perspective; and
- The ORR looked at the "unit cost" analysis performed by UIC-LICB (on the same dataset as that used for the econometric analysis).[15]

14 This work is summarised in Office of Rail Regulation (2008) *Determination of Network Rail's outputs and funding for 2009–14*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/383.pdf.

15 UIC = Union Internationale des Chemins de Fer (International Union of Railways). LICB = Lasting Infrastructure Cost Benchmarking, an internal UIC working group/programme concentrating on top-down cost benchmarking of maintenance and renewals processes across UIC members (including NR but excluding, at the moment, HS1).

Table 4.1: Assessment of the efficiency gap in the 2008 periodic review

Study	Efficiency gap (value/range)* (%)	Comments
ITS international benchmarking (gap at 2006/07)	43/36–50	No steady-state adjustment; to frontier of peer group; Maintenance (M) & Renewal (R) combined
	40/30–46	With steady-state adjustment; to frontier of peer group;* M&R
	42/38–49	No steady-state adjustment; to upper quartile of peer group; M&R
	37/24–43	With steady state adjustment; to upper quartile of peer group; M&R
BSL	M: 27 R: 44	With steady-state adjustment and labour cost adjustment; to average of peer group
	M: 50 R: 60	With steady-state adjustment and labour cost adjustment; to upper quartile of peer group
UIC/LICB unit costs (2005)	M: 47 R: 70	Harmonised unit costs; no steady-state adjustment; to average of peer group
	M: 38 R: 45	Harmonised unit costs; with adjustment for possible rail wage differential and steady-state (relative renewal volumes); to average of peer group

* The first number shows the efficiency gap against the relevant benchmark (frontier or upper quartile) resulting from the best stochastic frontier method, with the range being generated by applying alternative and simpler efficiency methods.

The ORR also commissioned work from consultants Railkonsult to understand the gap from an engineering/"bottom-up" perspective. Railkonsult highlighted improvement possibilities for NR in a range of areas, including asset inspection and management, recycling components, partial renewal of switches and crossings, high-output rail stressing, lightweight station platforms, use of dedicated and specialised (not generalist) engineering teams, re-railing techniques consistent with European best practice, ballast redistribution, and possession strategies.

In addition, EWS (now DBS) commissioned work from LEK and others to benchmark NR's cost against that of North American freight companies (Class I). Their studies found out that efficiency (productivity) improvement by freight railroads has been 4–5% per annum since deregulation in the early 1980s. They also found out that US average costs were between 3.3 and 5.1 times lower than NR's freight-only lines after adjusting for size, (lack of) electrification and other characteristics. Their own "gap" analysis of freight highlighted improvement possibilities for NR on track and other asset renewals, recycling and possessions management.

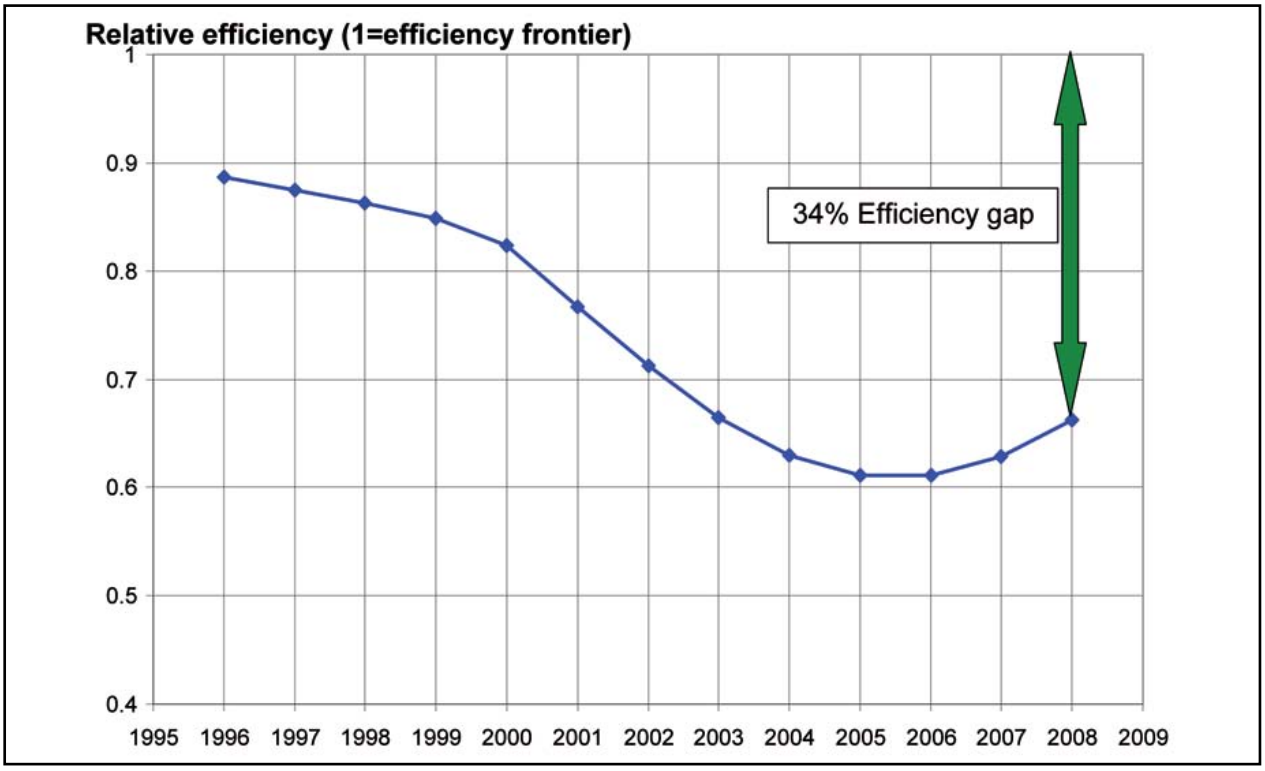
Taking into account these different parts of analysis, the ORR identified a 37% efficiency gap to the best performing European railways, and set efficiency targets so that two-thirds of this gap would be closed by the end of the next control period, CP4.

The ORR also commissioned work from consultants Oxera on operating cost efficiency. The study focused on evidence of efficiency improvements in non-railway sectors, giving particular attention to the efficiency improvements that are possible in operating expenditure. Oxera examined the reductions in Real Unit Operating cost Expenditure (RUOE) for the water industry (including Scottish Water), electricity and gas distribution, National Grid and BT for the various periods since these companies/industries were privatised.[16] Oxera found that the central range of RUOE reductions from other sectors was 4–6% per year. Based on this analysis, the ORR estimated an operating expenditure gap of 35% for NR for the end of CP3. Given that this analysis draws on the experience of other regulated sectors, it may also be relevant to train operating costs as well as NR.

Subsequent ORR work

The ORR has subsequently updated its work on econometric benchmarking on infrastructure maintenance and renewal costs to take into account the latest data from NR and European infrastructure managers (Figure 4.1). This work, based on data for 2008, confirms the ORR's earlier analysis and identifies an efficiency gap between NR and the top-performing European railways of between 34 and 40%.[17]

Figure 4.1: ORR latest international benchmarking on maintenance and renewal costs



Source: ORR.

16 Oxera (2008) *Network Rail's Scope for Efficiency Gains in CP4*. Oxford: Oxera This document can be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-oxeraeffic-160408.pdf.

17 Office of Rail Regulation (2010) *International Cost Efficiency Benchmarking of Network Rail*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/econometric_update_2010_orr_benchmarking_report.pdf.

The ORR has also commissioned further work, from consultants Balfour Beatty/Railkonsult,[18] to better understand the reasons for the efficiency gap. Large cost-efficiency gaps between NR and international peers were identified, driven by differences in contracting strategy, possessions strategy, system renewals, asset condition monitoring, renewal backlogs, workforce protection and effective network size.[19]

High Speed 2

As part of the work to identify high speed rail unit costs, HS2's top-down international benchmarking found that unit cost rates for high speed rail construction in the UK were typically up to double those being achieved in Europe.[20] Potential causes were identified as:

- the extent to which high speed rail was a discrete project rather than a programme which could lead to additional one-off costs such as skills development;
- a more prescriptive approach to the transposition of EU legislation;
- multiple layers of technical and commercial supervision due to the trend for multiple sub-contracting;
- more complex contractual relationships and a dependency on large external Programme Management teams to achieve confidence in overall integration; and
- the potential through the addition of optimism bias to create self-fulfilling project price inflation.

Infrastructure UK

Infrastructure UK[21] undertook further detailed work looking at project specific comparisons, which, while reinforcing the findings of the top-down benchmarking, generally found a more complex picture. Of particular relevance to rail were the following findings:

- While the examination of seven high speed lines across Europe showed that construction costs in the UK were significantly higher, when compared with the four most directly comparable projects, HS1 costs were at least 23% higher.
- Comparisons of station development costs indicate that the UK is 50% more expensive, for example, than Spain. However, UK stations are designed to serve a significantly higher peak passenger demand (up to 2.7 times) which could cause higher costs.
- While tunnelling civil engineering costs are similar to Europe, total outturn costs that involve significant tunnelling are more expensive than Europe, suggesting higher pre-construction and indirect costs.

Infrastructure UK also found higher infrastructure costs on UK road projects. Section 10.2 sets out potential reasons for the cost differences between UK and Europe.

18 RailKonsult (2010) *Relative Infrastructure Managers' Efficiency*. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/econometric_update_2010_railkonsult_paper.pdf.
19 The comparator railways are from Austria, the Netherlands, the US (Amtrak North East only) and France.
20 HS2 (2009) *HS2 Cost and Risk Model*. This document can be accessed at www.railwaysarchive.co.uk/documents/HS2_HS2CostAndRiskModel2010.pdf
21 Infrastructure UK (2010) *Infrastructure Cost Review: Main Report*. This document can be accessed at www.hm-treasury.gov.uk/d/cost_review_main211210.pdf

4.1.2 Train operating costs benchmarking from other sources

International train operating cost benchmarking

International comparisons suggest that other European countries have obtained significant cost reductions from the competitive tendering of services, in particular:

- the Netherlands, where tendering has led to an efficiency gain of 20–50% compared to directly awarded contracts which improved efficiency by 0–10%. The money gained by improved efficiency of services has, in general, been used to improve services;[22]
- Sweden, where tendering led to subsidy reductions of 20–30%;[23] and
- Germany, where tendering has led to cost reductions of around 20% while the service level and quality have been improved.[24]

In general, while there have been problems with some contracts, the efficiency gains in European countries appear to have been retained in further rounds of franchising. By comparison, unit costs of franchised services in Great Britain (after allowing for changes in service frequency and train length) increased by 17.1% between 1996/97 and 2005/06, despite an initial cost reduction of 13%.[25]

The differences in cost performance result largely from the differences in approach taken to franchising. While Great Britain has franchised nearly all passenger train services, franchising in Europe has tended to focus on subsidised regional services, with the majority of services continuing to be operated by the former state monopoly train company. This has allowed new franchised operators some flexibility over staffing, with staff given the opportunity to transfer to the new operator or remain with the state incumbent. While there have been problems in some circumstances, it has allowed new operators to increase labour productivity and therefore reduce overall costs. Other cost savings have come from reductions in rolling stock costs, depot costs and reductions in overheads.

Domestic train operating cost benchmarking

TOC cost benchmarking for rail companies within Great Britain suggests that there are significant efficiency differences between different train operating companies, with the efficiency of the best performing companies typically some 30% better than poorer performing companies. At least some of this cost difference is likely to be due to structural factors, such as the type of franchise (with significantly higher costs where TOCs are operating under management contracts) and the

22 van Dijk, H. (2007) Tendering and Decentralisation of Regional Rail Passenger Services in the Netherlands (1997–2005), *Proceedings of the Competitive Tendering of Rail Passenger Services*, *ECMT Workshop*. Available from www.internationaltransportforum.org/IntOrg/ecmt/railways/tendering06.pdf which refers to the presentations and gives a link to where the document can be purchased.

23 Alexandersson, G. and Hulten, S. (2007) Competitive Tendering of Regional and Interregional Rail Services in Sweden, *Proceedings of the Competitive Tendering of Rail Passenger Services*, *ECMT Workshop* and Alexandersson, G. and Longva, F. (2009) *Impact of Deregulation on the Performance of Long Distance Transport Services: A Comparison of the Different Approaches in Sweden and Norway*. www.internationaltransportforum.org/IntOrg/ecmt/railways/tendering06.pdf which refers to the presentations and gives a link to where the document can be purchased.

24 Brenck, A. and Peter, B. (2007) Experience with Competitive Tendering in Germany, *Proceedings of the Competitive Tendering of Rail Passenger Services*, *ECMT Workshop*. Available from www.internationaltransportforum.org/IntOrg/ecmt/railways/tendering06.pdf which refers to the presentations and gives a link to where the document can be purchased.

25 Smith, A and Wheat, P. (2009) *The Effect of Franchising on Cost Efficiency: Evidence from the Passenger Rail Sector in Britain*.

years remaining on a franchise. Other important factors include the average salary of staff, the adoption of the 35-hour working week and the density of train services.

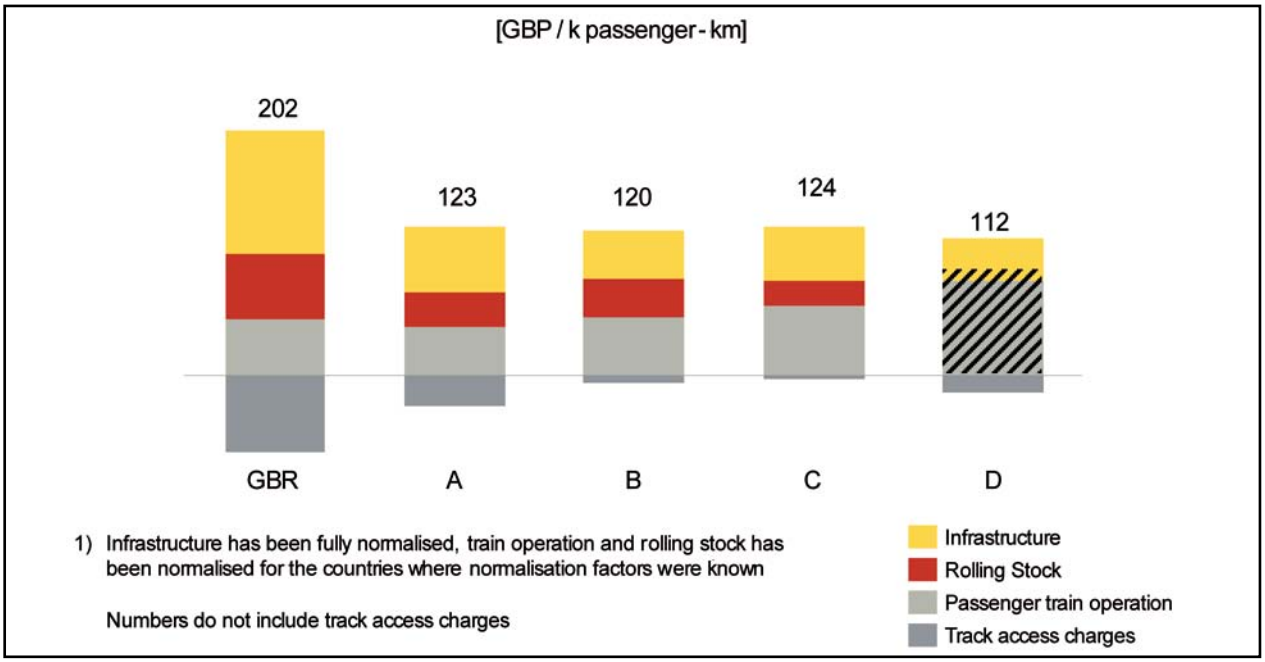
4.1.3 International benchmarking undertaken for this study

Overview

A key part of this study was to undertake whole-industry international benchmarking. The Study commissioned consultants Civity to benchmark whole-industry costs, separately examining elements of infrastructure and train operating costs across Great Britain and four European countries: France, the Netherlands, Sweden and Switzerland. Costs have, as far as possible, been normalised for underlying factors such as exchange rates (using 2009 purchasing power parities), degree of electrification, single or dual track, travel speeds and distance between stations stops. Cost comparisons are for year 2009, unless otherwise stated.

The benchmarking work undertaken by Civity suggests that GB rail's whole-system costs per passenger-km would need to reduce by some 40% to match those in the comparator countries, as shown in Figure 4.2, with GB costs particularly higher in infrastructure and rolling stock. The following sections provide more detail of these cost differences and the implications for the value for money of GB railways going forwards.

Figure 4.2: Comparison of whole-system costs (partly normalised) £/thousand passenger-km

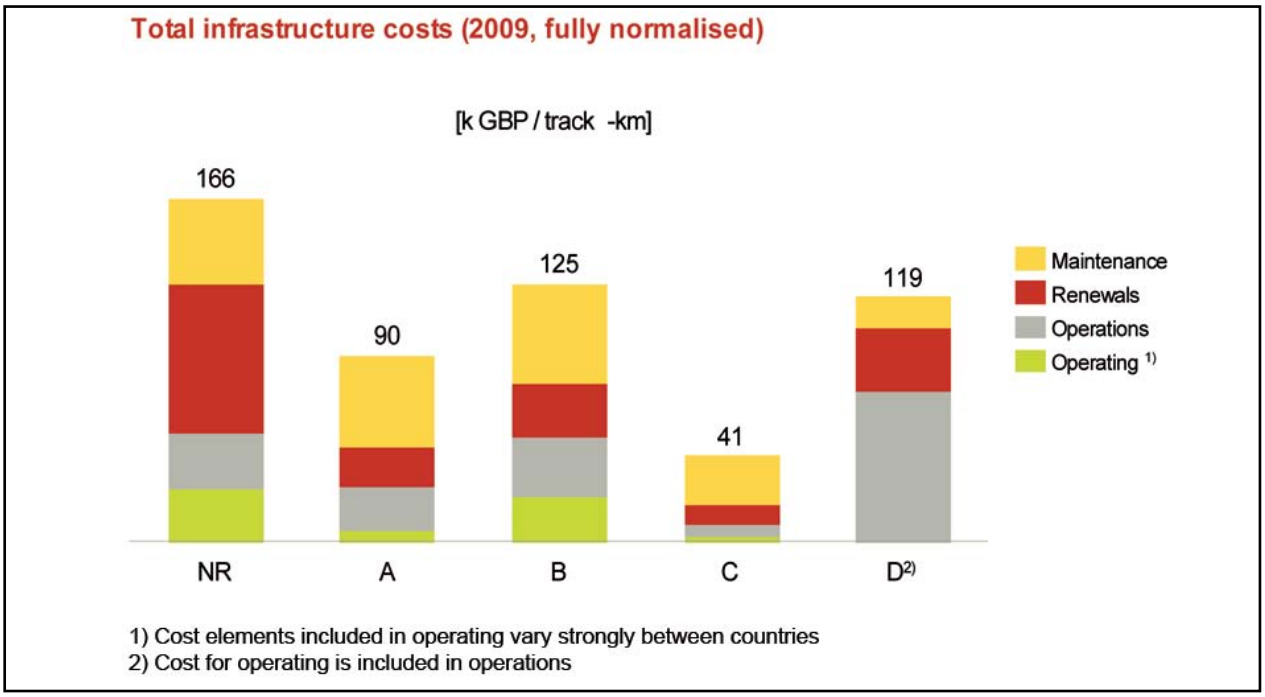


Source: Civity (2011).

Infrastructure cost benchmarking

Infrastructure costs per track-km are up to four times higher in Great Britain, as shown in Figure 4.3. The principal driver of higher GB infrastructure costs is significantly higher levels of renewals, which are around three times higher than in other countries. Higher track utilisation in the Netherlands and Switzerland reduce average costs per track-km in these countries. This is discussed further in the capacity utilisation section of the report (Section 17).

Figure 4.3: Comparison of infrastructure costs across countries



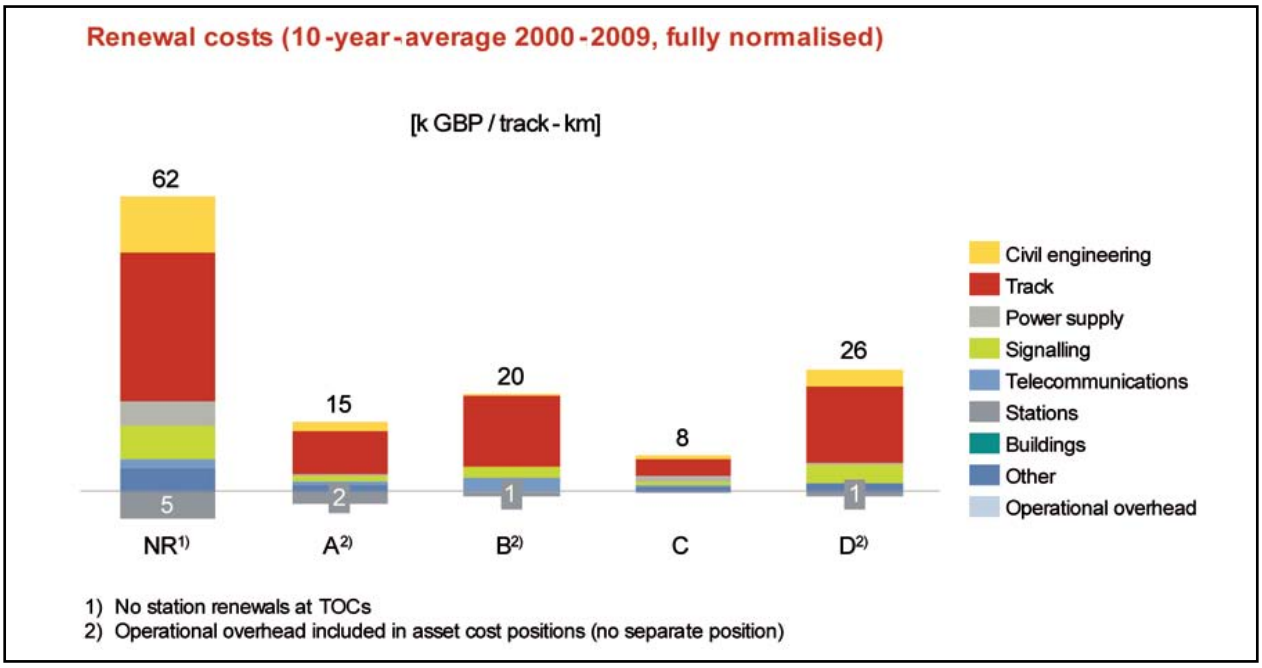
Source: Civity (2011).

Higher GB renewals costs may have a number of causes. Renewals expenditures are determined by work activity volumes and unit costs. Therefore, a period of increased renewal expenditures (e.g. to catch up an investment backlog) does not necessarily reflect inefficiency in unit costs and, vice versa, an infrastructure manager with low expenditure levels in the comparison might just invest less in its network and consequently build up an investment backlog.

To get an idea of steady state investment levels, Civity considered the level of renewals over ten instead of five years (a 30-year view would be required to give a full steady state adjustment). This still shows that NR costs are significantly above those of the European comparators. While some of this may reflect catch-up on previous backlog and under-investment in other countries, it is likely that a significant efficiency gap remains, with a similar gap identified by the ORR's econometric benchmarking.

Similar to at least one other country in the comparator set, NR is carrying out substantial signalling renewals. Volumes of other renewals are also high (track-related and civil engineering works), although part of the gap on track could be due to the lower utilisation of high output machinery which can be more efficient if used intensively (Figure 4.4).

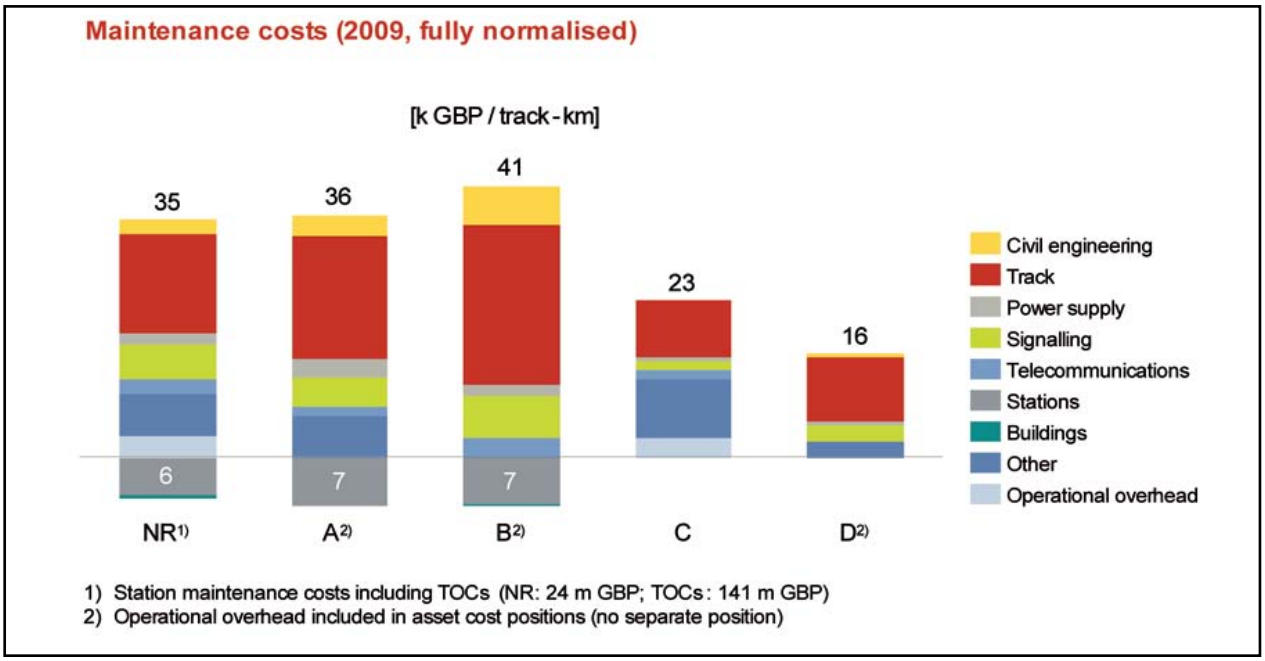
Figure 4.4: Comparison of infrastructure renewals costs across countries



Source: Civity (2011).

Given the high level of renewal costs, it appears that NR's maintenance costs may also be too high. Infrastructure companies can trade-off between maintenance and renewal costs, i.e. if other companies are renewing less, their maintenance costs should be higher. Figure 4.5 shows that this does not appear to be the case. This therefore implies that NR is likely to have a residual efficiency gap on maintenance, which will need to be addressed in the future (again this is consistent with the ORR's international benchmarking).

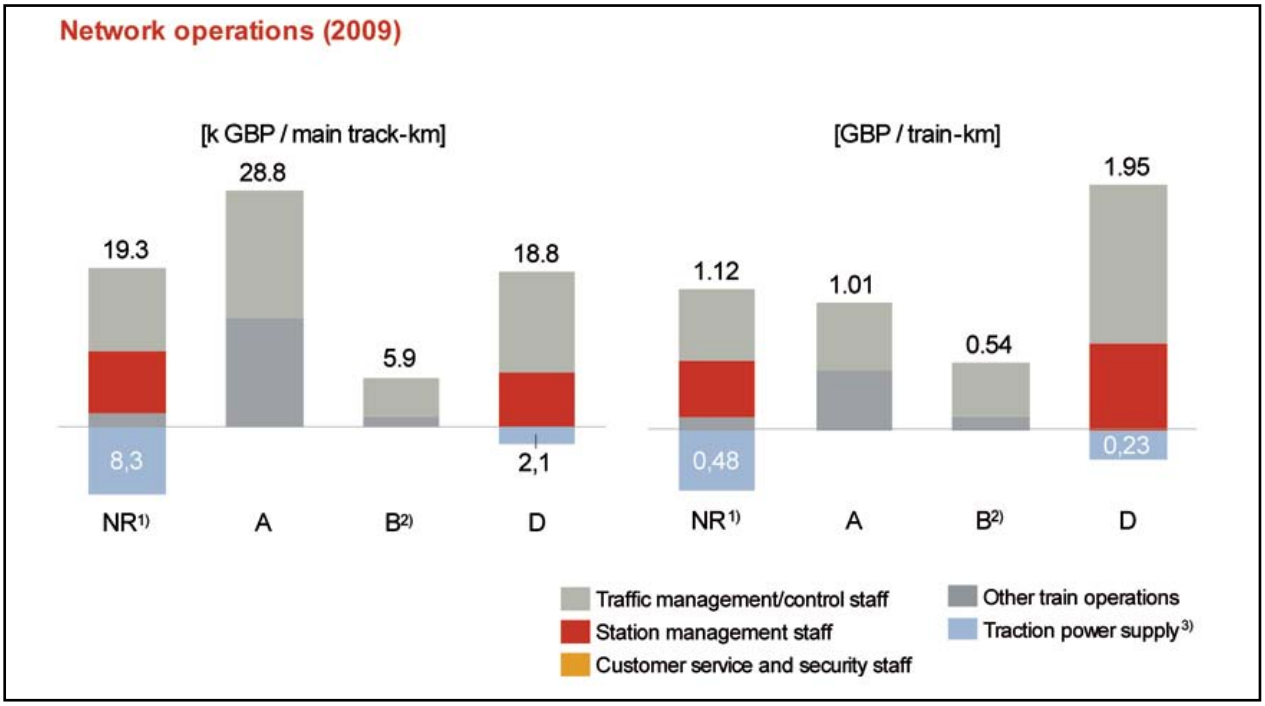
Figure 4.5: Comparison of infrastructure maintenance costs across countries



Source: Civity (2011).

There is greater variability in infrastructure operations costs (that is costs related to traffic and station management and traction power supply) across countries, as shown in Figure 4.6. One potential reason for relatively high costs in Great Britain is that NR has fewer control centres and too much manual signalling. NR is seeking to address this by the introduction of more control centres and this is discussed further in the section on operational performance (Section 18).

Figure 4.6: Comparison of infrastructure operations costs across countries



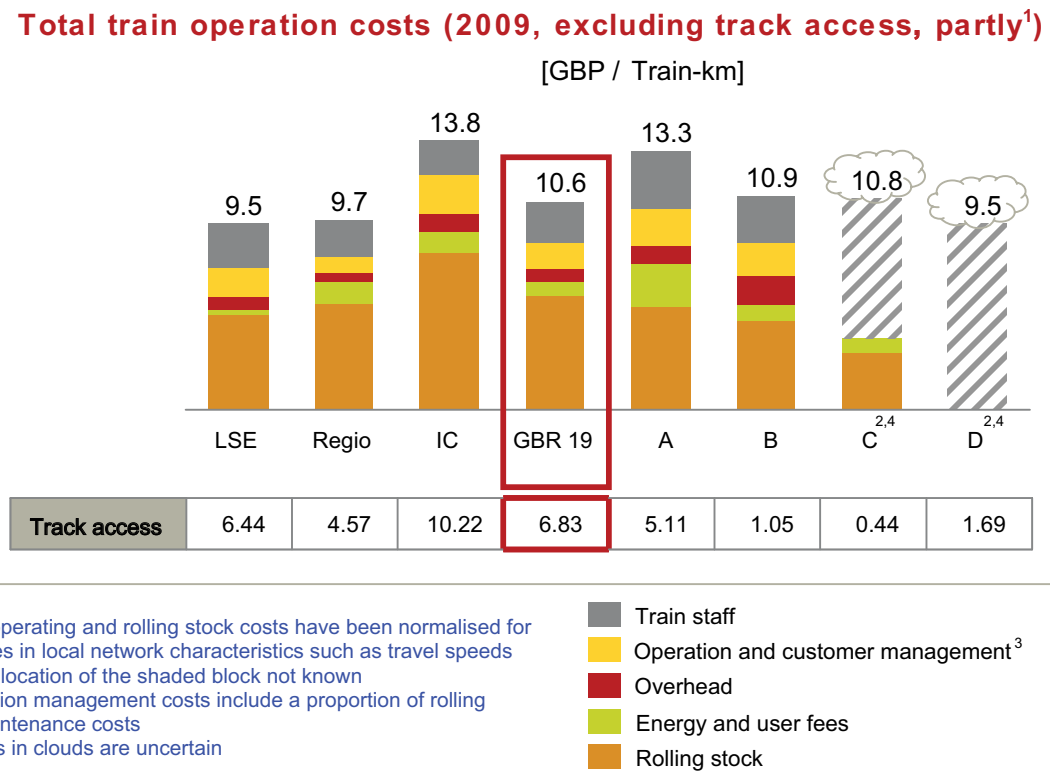
Source: Civity (2011).

Train operating cost benchmarking

Civity's benchmarking appears to indicate that GB train operating costs per train km are slightly below those of the comparator companies in Europe as shown in Figure 4.7.

Within this comparison rolling stock costs in GB appear to be higher than the comparators although no allowance has been made for rolling stock age or quality. Train staff, other staff costs and overhead costs are lower. Were all these figures to be adjusted for train utilisation (passenger km per train km) the Study would expect the GB performance to be worse than the comparator countries.

Figure 4.7: International comparison of train operating costs



1) Train operating and rolling stock costs have been normalised for differences in local network characteristics such as travel speeds
2) Cost allocation of the shaded block not known
3) Operation management costs include a proportion of rolling stock maintenance costs
4) Figures in clouds are uncertain

Source: Civity (2011).

Civity's benchmarking suggests that the cost of franchised GB rail services is likely to be higher than similar franchised services in Europe:

- The cost of franchised services in GB is similar to those of **state** railways in Europe;
- Franchising in Europe has led to cost reductions of 20-40% compared to state railways; and
- Franchising in GB has shown little, if any, reduction in unit costs.

The Study would therefore expect franchised services in Europe to cost at least 20% less than in GB. This appears to be borne out by benchmarking work carried out by Civity, which shows that franchising has reduced train operating costs in Germany by an average of 26% and that German franchised regional services are around 40% less expensive than in Great Britain (although no attempt has been made to normalise the data and so this could overstate the difference). This therefore implies that the way that franchising has been carried out in Great Britain has limited the achievement of cost savings seen elsewhere.

Whole-system costs, revenues and subsidy

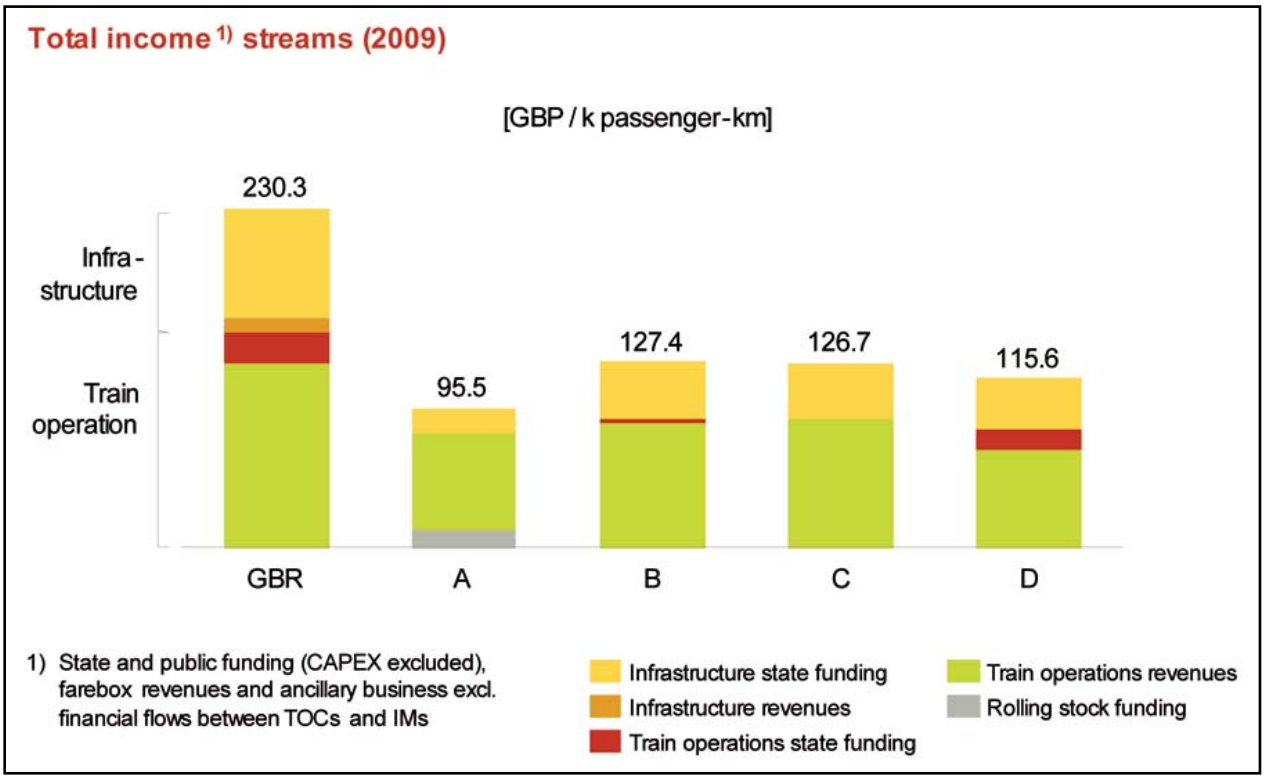
The benchmarking carried out by Civity shows that total system costs in GB rail are higher than in the comparator European railways (as shown in Figure 4.2). These higher costs are borne by a mixture of higher taxpayer subsidy and higher fares, as shown in Figure 4.8.

Civity's benchmarking shows that average fares in Great Britain (as measured by revenue per passenger-km) would need to reduce by at least 30% to match those elsewhere in Europe. Work previously undertaken for Passenger Focus suggests that this is due to significantly higher walk-up

fares and season tickets, although advance purchase tickets can be cheaper.[26] Differing yields from first-class fares may also be a factor.

The higher whole-system costs appear to result in significantly higher subsidies per passenger-km. This partly reflects lower utilisation of the railway in Great Britain. It should also be noted that subsidy in other countries should be regarded as indicative as it can be affected by debt write-offs, treatment of capital expenditure, the coverage of the benchmarking and other factors. Nevertheless, it appears clear that the high costs in GB railways are leading directly to high subsidies, and without reductions in costs it is unlikely that subsidy can be reduced significantly.

Figure 4.8: Comparison of railway income streams



Source: Civity (2011).

Note: System income differs from system costs as the former has not been normalised for local infrastructure and train operating characteristics.

4.2 Potential for cost savings

4.2.1 "Should cost" exercise

The Study's theoretical "should cost" analysis looked at what the GB railway should cost if it was operating at the frontier of efficiency, having made efficiency improvements in line with best-performing companies in other regulated industries. In particular, the assessment has drawn on a broad range of evidence, including that gathered by the ORR at the last periodic review, as well as other GB and international benchmarking. The assessment takes no account of the deliverability of potential savings. The assessment should therefore be treated with a significant degree of caution

26 Passenger Focus (2009) *Fares and Ticketing Final Report*.

and the numbers are subject to a significant measure of uncertainty. The Study's analysis is on the basis that:

- best-performing companies in other regulated industries have experienced efficiency gains of around 4% per annum for up to 10 years, with gains continuing at 2-3% per annum in the next 10 years (this is similar to the cost reductions found in US Class 1 railroads);
- for NR, at the lower end, the Study has assumed that it can close the indicative efficiency gap identified in the 2008 periodic review; at the upper end the Study is assuming that its performance might exceed that of the best-performing European railways, and experience similar cost reductions to those found in US Class 1 railroads and the best-performing regulated companies. Efficiency adjustments have been made to NR's operating, maintenance and renewal costs, but not enhancements, due to the difficulty of getting reliable benchmarks in this area; and
- for train operating companies, at the lower end, the Study has assumed that costs return to the levels per train-km seen immediately post-privatisation (in line with the cost reductions made by freight operating companies and open access operators); at the upper end the Study has assumed that costs could fall by a further 10% per train-km, drawing on evidence from franchising in Europe which has delivered 20–40% reductions in costs.

On these top-down assumptions, the Study's "should cost" analysis suggests that, compared with 2008/09, there could potentially be a whole-industry efficiency gap of between £2.5bn and £3.5bn. The efficiency improvements being made by NR in Control Period 4 (CP4), and that the ORR indicates could be made in CP5, would reduce this gap to between £0bn and £0.5bn in NR's expenditure if NR delivers in line with the CP4 settlement and the ORR's indicative range for CP5. The analysis indicates a gap of between £0.7bn and £1.2bn in train operating expenditure if no further improvements are made to the efficiency of TOC (including ROSCOs) delivery beyond the level achieved in 2008/09 (Tables 4.2 and 4.3 show the low estimate and the high estimate of the efficiency gap).

Table 4.2: Low estimate (£bn, 2008/09 prices)

	TOCs and ROSCO	NR	Total
Low estimate of efficiency gap	0.7	1.8	**2.5**
Less NR savings committed for CP4		-1.2	**-1.2**
Less NR savings provisionally indicated by ORR for CP5		-0.6	**-0.6**
Remaining efficiency gap	**0.7**	**0.0**	**0.7**

Table 4.3: High estimate (£bn, 2008/09 prices)

	TOCs and ROSCO	NR	Total
High estimate of efficiency gap	1.2	2.3	**3.5**
Less NR savings committed for CP4		-1.2	**-1.2**
Less NR savings provisionally indicated by ORR for CP5		-0.6	**-0.6**
Remaining efficiency gap	**1.2**	**0.5**	**1.7**

It should be noted that all of the figures for potential cost savings in Tables 4.2 and 4.3 are on an "expenditure" basis, i.e. the savings would represent reductions in real expenditure. but would not necessarily translate directly into cash savings of the same amounts to Government because of the accounting effect of NR's Regulatory Asset Base. Also, some savings would accrue first to others (NR, and TOCs particularly) and would feed through to Government only at control period ends or at franchise renewals. The impact on the "should cost" figures of closing the efficiency gap is summarised in Table 4.4.

Table 4.4: Impact on industry costs of "should cost" exercise (2008/09 prices)

	Low savings (£bn)	High savings (£bn)
Total industry expenditure (2008/09 actuals)	12.0	12.0
Effect of closing the total efficiency gap	-2.5	-3.5
Resultant reduced industry costs (using 2008/09 base)	9.5	8.5

On this basis, closing the total efficiency gap would require an efficiency improvement in the range 20–30%. This is a very substantial change, but, as explained later, the Study considers that a 30% gap could be closed if the recommendations from the Study are implemented in full.

Given that NR has accepted the challenge of meeting the CP4 targets and is preparing to continue the savings drive in CP5, a substantial proportion of the remaining gap would have to be closed by reducing TOC and ROSCO costs.

4.2.2 Interim Submission

The Interim Submission identified possible savings from the initiatives proposed by the Study. It suggested that by 2018/19 these could be in the range £600–1,000m per annum. This initial analysis was based on a bottom-up view of the savings achievable from different areas of the Study.

However, it was stressed that this represented an interim view and would be revised as the Study's work was completed.

4.2.3 Estimating cost savings for the final report

In working up an updated estimate of the overall savings achievable from the Study's recommendations, the Study used the following principles:

- the estimation should draw, as far as possible, from the detailed analysis carried out within the individual themes;
- care should be taken to identify and eliminate any "double count" of savings between themes;
- the savings estimates should be additional to any savings that the Study anticipates being delivered through existing industry targets or assumed in ORR/DfT projections;
- the cost of implementing the proposals should be netted off the savings estimates;
- the savings should be on the basis of reductions to annual funding levels for the industry; and
- the range of estimates should be sufficiently broad to reflect the inherent degree of uncertainty in the analysis, but narrow enough to provide meaningful information on the financial value of the Study's proposals.

Since the publication of the Interim Submission, considerable further work has been carried out to evaluate the savings that could be achieved. This work has entailed:

- the estimation of savings (and any additional costs) by theme and savings type for the period up to 2018/19. These estimates draw from the consultancy work carried out in each theme, as well as analysis carried out within the Study. Where a single estimate could not be provided, low and high ends of a range were provided;
- a challenge of these bottom-up savings to ensure their robustness and internal consistency – this included ensuring that a consistent set of "baseline" costs was used for all estimates;
- an identification of areas of "double count" where the same savings were "claimed" by more than one theme. Where specific overlaps could be identified these were removed from the themes' estimates. Where there was concern of a more general overlap between themes, an averaging approach was taken with an equal weighting placed on each estimate of savings; and
- an assessment of the impact of capital expenditure savings on industry funding. Such savings would not benefit industry funding pound-for-pound in year because of the way in which infrastructure and rolling stock owners are remunerated for their investment. Therefore there was the need to consider how such savings would materialise as reductions in funding over time.

Grant Thornton was engaged to examine the work carried out under this process; they provided assurance that it was carried out in a sound and accurate manner.

Making any such estimate of savings inevitably requires significant simplification and judgement. The results should therefore be interpreted only as broadly indicative of the financial value that could be released through the implementation of the Study's proposals. The Study would, in particular, urge caution in relation to the following aspects of the calculation:

- There may be significant dependencies between different themes and the savings delivered by them. Because of this the savings figures need to be seen as associated with the full package of proposals and cannot be readily sub-divided.

- The implementation costs associated with these savings generally occur in earlier years and so are netted off the Study's results (although the Study's analysis suggests these costs are small in comparison with the net savings).
- The 2018/19 savings figure represents a snapshot in time. Some elements of these savings may not be sustained; for example, they include savings to capital programmes which will later be completed and which may or may not be replaced by equivalent investments in future plans. On the other hand, they do not reflect the full value of capital expenditure savings which will eventually be passed through as funding savings over time.

4.2.4 Resultant savings estimates

On the basis of the work described above, the Study estimated the savings shown in Table 4.5.

Table 4.5: Estimate of savings in year 2018/19, in 2009/10 prices

Study Area		Low case (£m)	High case (£m)
A	Industry objectives, strategy and outputs	90	110
B & C	Leadership, structures, interfaces and incentives	40	130
D	Revenue	90	90
E & F	Asset management and supply change management	230	580
E & F	Programme management	40	100
G	Safety, standards and innovation	190	190
H	People	260	260
Less:	Double counts	(200)	(410)
Net funding savings		**740**	**1,050**

The estimates in Table 4.5 indicate the savings that might be achievable in 2018/19. These savings have been adjusted to reflect the effects of the Network Rail RAB, but other savings would accrue first to other parties (NR< TOCs etc.) and would feed through to Government only at the commencement of new franchises and control periods. The annual savings increase gradually towards 2018/19, as shown in Table 4.6 in 2009/10 prices.

Table 4.6: Estimated profile of savings in each year

	£m 2009/10 prices	
	Low savings in year	High savings in year
2012/13	30	36
2013/14	123	144
2014/15	138	201
2015/16	335	448
2016/17	452	629
2017/18	590	827
2018/19	740	1,050

4.2.5 Possible improvements in train utilisation

The Study report touches on the issue of train utilisation (i.e. the number of passenger-km per train-km) in several sections of the Level 2 report – in benchmarking (Section 4.1.3) and in Capacity Utilisation and Management (Section 17). The lower level of train utilisation in Great Britain accounts for a significant proportion of the differences in cost per passenger-km between GB rail and comparator countries.

Improving train utilisation will not be simple, due to the many causal factors involved, and it is unlikely to reduce the cost base directly. However, it has the potential to increase the productivity of the system as a whole and to reduce the need for significant future expenditures on increasing capacity. For example, a 5% improvement in train utilisation could represent a productivity improvement potentially worth some £500–700m annually against costs of future growth.

4.2.6 Conclusion on cost savings

Taking into account the cost savings that Network Rail is targeted to achieve, plus the £1,050m savings that the Study estimates could flow from its recommendations, plus future potential gains from train utilisation, the Study considers that the target of a 30% efficiency improvement could be delivered by 2018/19.

It must be emphasised that estimates of cost savings eight years out, which could result from initiatives not yet adopted, are highly uncertain. They should not be regarded as firm projections.

It should be emphasised also that the savings estimates depend on the adoption of a complete package of reform. In particular, the main areas for which savings can come will not deliver unless the enabling environment (objectives, strategy, leadership, structures, interfaces and incentives, etc.) is put in place.

5. Area A – Industry objectives, strategy and outputs

5.1 Industry objectives

5.1.1 Description of studies and analysis

The Study has reviewed industry objectives and, in particular, the Government's role, its policy aims, and whether all parties in the sector are aligned with the objective of delivering improved efficiency and value for money.

The Study has carried out extensive research and has held a number of workshops and interviews with relevant industry parties, with a view to identifying opportunities to improve value for money across the industry.

5.1.2 Evidence base

The primary sources of evidence for this area of the Study were:

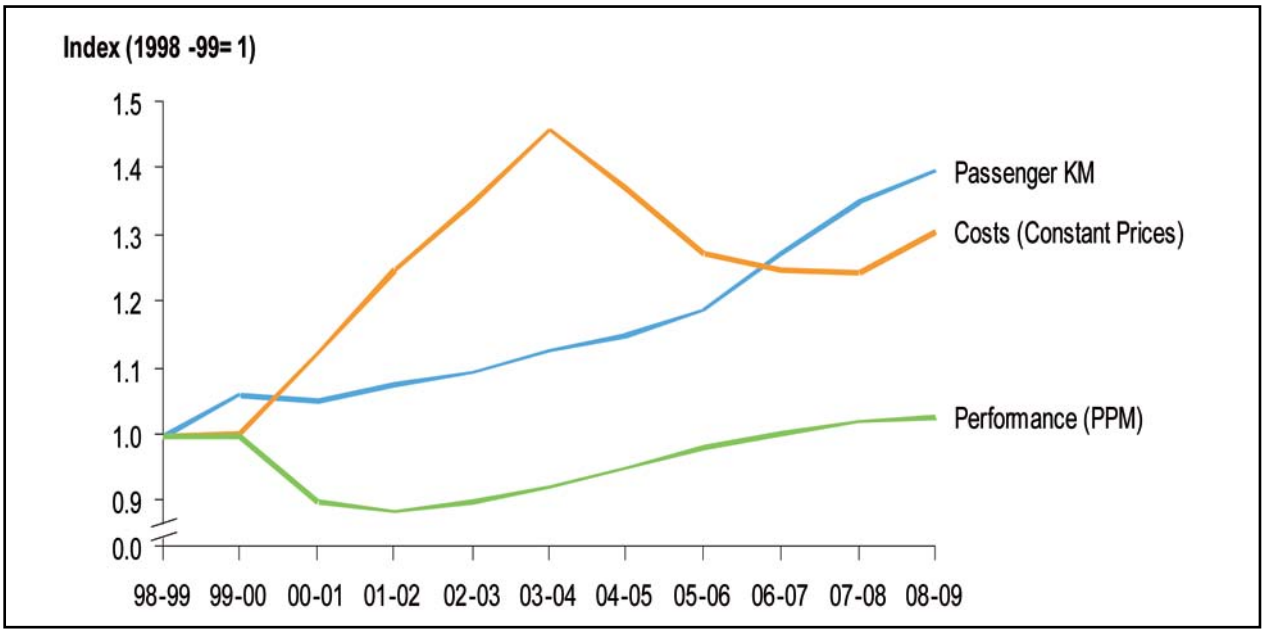
- Booz and Company (2010) *Costs of Railway Outputs*;
- Booz and Company (2011) *Rail Value for Money Study: Research on VfM Assessment*;
- Atkins (2011) *Whole-system Programme Management*;
- Steer Davies Gleave (2010) *Leadership, Planning and Decision-making*; and
- Department for Transport (2007) *Delivering a Sustainable Railway*.

In addition, this area has been informed by stakeholder working groups, discussions with relevant industry parties, and submissions received from interested parties.

5.1.3 Background information and key data

Figure 5.1 demonstrates the success of the industry in delivering increased outputs and reliability performance. But it also demonstrates how costs have increased significantly (up by around a third since 1999).

Figure 5.1: Indexed trends in performance, passenger-km and costs



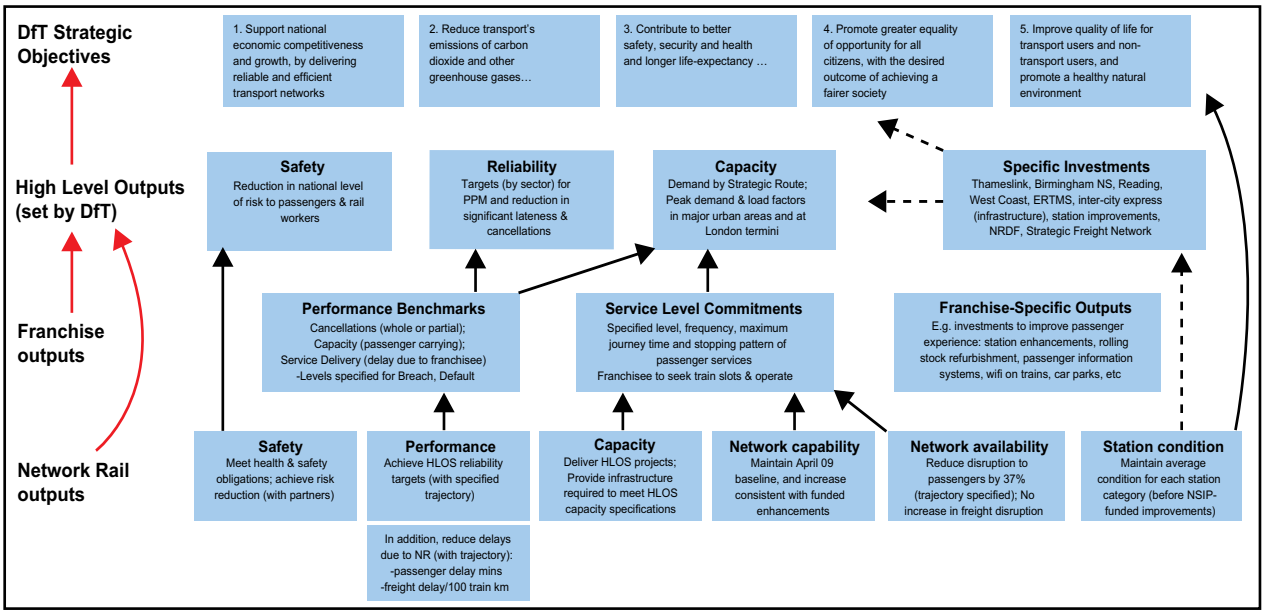
The HLOS/SoFA process was established by the Railways Act 2005 as a mechanism whereby Government could set the general direction of the industry, align the outputs it wanted in return for subsidy (particularly in relation to Network Rail (NR)), and establish funding stability in the medium term (i.e. five years).

Through this process (with a parallel process in Scotland), Government shapes the objectives of the rail system – by defining the outputs it wishes to fund (the High-Level Output Specification, HLOS) within its proposed funding envelope (Statement of Public Funds Available, SoFA). Its aim is to end up with a set of affordable outputs which are then expressed in NR's five-year settlement. These outputs are the product of the periodic review process involving the Office of Rail Regulation (ORR), the Department for Transport (DfT), NR and others. In the first iteration (HLOS1), they were defined as a series of – funded – high-level outputs to be delivered by the end of Control Period 4 (CP4) (2014), covering the following areas:

- Safety – a 3% reduction in risk;
- Reliability – an improvement in the "public performance measure" (PPM) to reach 92% (93% for London and the South East);
- Capacity (Demand) – an increase in the carrying capacity, specified for each major city and London terminals; and
- Projects – the delivery of various major projects and other investments, such as the Thameslink Programme, improvements at Birmingham New Street, Reading and other stations.

These outputs were designed to support the DfT's five Strategic Objectives of the time, as then enshrined in the Department's business plan. Figure 5.2 shows the hierarchy of outputs which were driven by the process.

Figure 5.2: Hierarchy of railway outputs (England and Wales)



Sources: DfT, ORR, Booz and Company analysis.

The DfT is currently starting the next iteration of the HLOS/SoFA process, which provides an opportunity to address the barriers highlighted below.

In assessing the merits of this process in relation to the rail delivery chain, this section of the Study has been informed by the analysis carried out by Atkins into asset and supply chain management, which included a high-level assessment of the rail sector compared to best practice in industries such as electricity and highways, and among other railways, including the Netherlands and Sweden. Work carried out for the Study by Atkins into asset and supply chain management has identified that a whole-system approach – building on better incentives and alignments across the sector – could achieve significant value for money improvements.

Such a whole-system approach depends on all parties having strong incentives and alignments, and a clear "line of sight" between outputs on the ground (e.g. renewal work to improve reliability on a particular route) and high-level objectives (e.g. the HLOS/SoFA output for reliability). However, the Atkins study also shown that misaligned objectives hamper such an approach in the GB rail sector.

5.1.4 Barriers to efficiency

The HLOS/SoFA process itself is generally fit for purpose, but HLOS1 is now out of date

The HLOS process has been viewed by the industry, and independent commentators, as generally successful. That said, the first HLOS iteration focused naturally on issues important at that time and its follow-through has not been able to address all the emerging issues facing the rail sector. Nor does it fully reflect the DfT's current objectives, which have been revised since the first HLOS/SoFA iteration.

The current HLOS/SoFA process does not provide a clear focus on cost reduction

The absence of an explicit cost-reduction target represents a significant barrier to efficiency across the sector to improve value for money.

The previous focus on capacity projects, without reference to strong value for money controls, may, in itself, have contributed to lower value for money outcomes

In this respect, it is important to note the conclusions elsewhere in this report which indicate that, without thorough option appraisals at the very start of construction projects, there is a risk that high cost options may be pursued unnecessarily. It is also worth noting that, while such investments often have satisfactory business cases, many of the benefits can accrue to the wider economy, while incurring a net financial cost to the rail network itself.

The HLOS/SoFA process provides an effective mechanism for driving NR outputs, but there is a weaker link to TOC franchising decisions

Although the DfT takes account of HLOS/SoFA commitments in defining franchise specifications, many of the outputs described therein were not HLOS-driven, but were based on previous franchise specifications and other inputs. The process for defining service specification, fares and other aspects of train operations customer service is semi-detached from the HLOS/SoFA one. Such a disconnect would be acceptable if HLOS/SoFA was a process simply for setting NR outputs (which it currently **is**), but not if it is to be part of a whole-system approach to the industry (which it currently is not, but should be). In addition, the five yearly cycle of HLOS/SoFA is not strongly aligned to franchise funding processes, so any outputs generated by that process (e.g. enhancement projects to deliver improved capacity on services operated by a long established Train Operating Company (TOC)) have to be negotiated with incumbent TOCs. This risks a higher cost than would be achieved through open competition.

There is not always a clear "line of sight" between the high-level objectives and outputs lower in the hierarchy, particularly because the link to franchising is weak

The Atkins study concluded that there are misaligned strategies and incentives in different parts of the industry (e.g. removal of a disused siding could reduce industry costs, but it is not in a train operator's interests to agree the necessary Network Change, even if the operator has no foreseeable need for the asset). This can be exacerbated by misaligned and short-term planning and budgeting cycles (e.g. the ROSCO's interests are to manage the rolling stock to lowest whole-life cost over the asset life, typically 40 years, but the franchisee is only interested in short-term cost minimisation within its franchise period, potentially driving up whole-life costs by preventing a longer-term perspective to asset management). These factors represent a barrier to the whole-system approach favoured by this Study.

Lack of clarity/understanding as to roles and responsibilities

Feedback from industry stakeholders has shown that terms like "strategy", "objectives", "outputs" and "policies" often mean different things to different people or organisations in the sector. This lack of clarity has led to confusion as to who is responsible for what. In this respect, the Study notes that the DfT's publication which supported the last HLOS iteration (*Delivering a Sustainable Railway* (2007)) was framed in terms of "strategic aims" for the network. This tended to reinforce the view – discussed later in this section – that Government is responsible for Strategy, and has undermined the concept of industry-level "strategies", for which the industry itself should be responsible.

5.1.5 Principal issues

Ensuring the next HLOS/SoFA iteration reflects the revised objectives of Government

HLOS1 was based on the DfT's strategic objectives as they were in 2007, but, in order to align with the Government's current objectives, HLOS2 (which is currently under development by the DfT, prior to further ORR and industry involvement) would need to be informed by the DfT's new Business Plan Vision/Priorities, as introduced by the Coalition Government. These already reflect the key objective of cost reduction, and are framed as shown in Figure 5.3.

Figure 5.3: Extract from DfT's Business Plan

"Vision

...Our railways must also play their part in building a more modern and effective transport system – it is right that we demand greater efficiency from our network, and from rail franchise operators...

...Structural Reform Priorities

Secure our railways for the future

Secure the sustainability of the railway and create capacity for improvement of services, by addressing the high cost of the UK railway compared with other railways and comparable industries; continue to invest in Crossrail and Tube upgrades in the capital.

Encourage sustainable local travel

Encourage sustainable local travel and economic growth by making public transport (including light rail) and cycling and walking more attractive and effective, promoting lower carbon transport and tackling local road congestion..."

Providing a clearer focus on cost reduction

The Study considers that the above Vision and Structural Reform priorities should be reflected clearly in the next HLOS/SoFA iteration, together with such other priorities as are required to make the Government's intent clear.

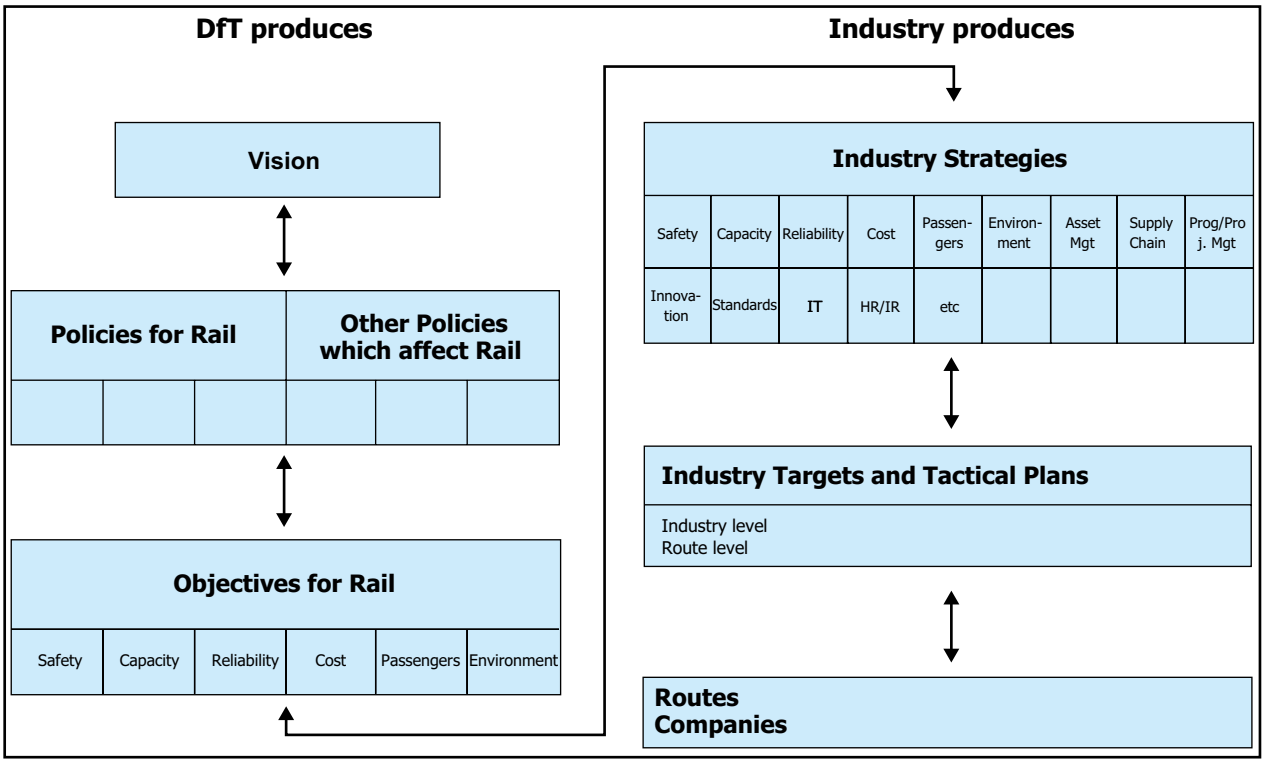
In addition, as part of the HLOS/SoFA development work, the DfT would need to produce a valid, measurable, objective for cost reduction – which could be framed at a high level, either in terms of a specific target for unit cost reduction (as with the current reliability output) or defined as a reduction in cost against current levels (as with the current safety output).

Providing a clearer "line of sight" to high-level objectives

Importantly, Government defined objectives, especially for cost reduction, should not only shape NR outputs through the normal HLOS process, but should also be used either as an underlying assumption when deciding on the general approach to franchising, when making franchising decisions or as an explicit target in franchise specifications.

The Study has concluded that the inclusion of a clear cost objective would need to be linked into a clear hierarchy of vision, policies, objectives and strategies, as illustrated in Figure 5.4.

Figure 5.4: Revised hierarchy for objectives and strategies



An important requirement of such a process would be for the industry to take responsibility for developing the cross-industry strategies in the top right-hand box of Figure 5.4, including a strategy for cost reduction (covered in more detail later in this section). The model for this would be similar to the approach which delivered the reliability benefits specified in HLOS1, led by the cross-industry National Task Force. Elsewhere in this report the Study is recommending a Rail Delivery Group which could, as a primary objective, co-ordinate cost reduction, and other related strategies, in a similar way to the National Task Force (NTF).

The Study notes that the DfT is reviewing the criteria used for assessing benefit–cost ratios (BCRs) in relation to the value for money of individual projects, increments to franchises, fares decisions and other appraisals. Currently, BCR weightings reflect priorities relating to the DfT's previous Business Plan objectives for the transport sector – and there might be scope for fine-tuning to reflect a different balance of priorities and objectives. To the extent, however, that these criteria are largely aligned to the Treasury Green Book guidance on economic appraisal, more might be achieved simply through a greater emphasis on cost reduction and affordability in investment appraisals.

Improved clarity and understanding as to roles and responsibilities

Refining the planning process as described above is intended to ensure that the Government's part of the process is focused on policies and outcomes, while industry strategies and plans are focused on delivery. The intention would be that:

- the vision, policies and objectives established by Government for the industry are clearer, internally-consistent, and include a clear focus on cost reduction;
- there is greater clarity as to the industry's role in developing those strategies that are necessary at industry level to ensure that Government objectives can be delivered;

- there is a clearer policy and strategic framework within which companies can develop their own objectives and plans; and
- the Government's economic appraisal mechanisms are aligned with the rest of this planning framework.

5.1.6 Recommendations – for cost reduction

The Study considers that Government could do more to be clear about what Government policy is, harmonise between different strands of policy for and related to rail, and link between the different levels of policy, strategy and implementation. While the Government's HLOS sets out its policy position on a five-yearly basis, subsequent decisions at times appear to have been made without reference to that vision.

The Study recommends that the current high-level HLOS/SoFA process should be retained, but should:

- be accompanied by a clear hierarchy of policies, objectives and strategies, with clear definitions and descriptions of who is responsible for each – with clear linkages, vertically and horizontally;
- reflect the Government's objectives of "greater efficiency from our network" and "addressing the high cost of the UK railway compared with other railways and comparable industries", as expressed in the DfT's current Business Plan;
- be supported by the industry developing co-ordinated strategies as necessary for cost reduction and other industry-level activities through a Rail Delivery Group; and
- include an explicit cost-reduction output.

In addition, the Study notes that the DfT is reviewing the decision-making process, including the role of the BCR mechanism. The Study recommends that changes should reflect the above planning framework, and place greater emphasis on cost reduction and affordability in investment decisions.

5.1.7 Potential for, and timings of, cost savings

In themselves, the recommendations above are very much enablers for the detailed measures/savings outlined later in this report. An illustration of the savings which could be delivered through the above approach is that an estimated £26m per year could be generated as a result of a trade-off between a cost-reduction objective and the reliability one (i.e. if operators were given more flexibility about which parts of their network required higher standards of reliability performance than others, rather than an across the board requirement to invest in improved performance).

5.1.8 Implementation plan

Railway investment operates to five-yearly Control Periods, prior to which the ORR carries out a Periodic Review, aimed at aligning NR objectives with an affordable set of outputs driven by the HLOS/SoFA process. The main way in which a new set of high-level objectives would impact on spending is therefore by including them as part of the next iteration, which is planned to start imminently.

5.2 Strategy

5.2.1 Description of studies and analysis

The Study has considered the process of developing strategies in the rail sector, ranging from top-level strategies about the purpose and overall direction of the railway, to strategies concerning the detailed running of the railway – e.g. signalling and electrification.

The Study has carried out extensive research and has held a series of workshops and interviews with relevant industry parties, with a view to identifying opportunities to improve efficiency and value for money across the industry.

5.2.2 Evidence base

The primary sources of evidence for this area of the Study were:

- Booz and Company (2010) *Costs of Railway Outputs*;
- Booz and Company (2010) *Rail Value for Money Study: Research on VfM Assessment*;
- Atkins (2011) *Whole-system Programme Management*;
- Steer Davies Gleave (2010) *Leadership, Planning and Decision-making*;
- PriceWaterhouseCoopers/Institute for Public Policy Research (2011) "Who's Accountable", included as Annex 6 to *Research Project on Unit Costs and Franchising; Study 10002*;
- Department for Transport (2007) *Delivering a Sustainable Railway*; and
- Investors in Excellence (2010) *EFQM Analysis of the Rail Sector*.

In addition, this area has been informed by stakeholder working groups, discussions with relevant industry parties, and submissions received from interested parties.

5.2.3 Background information and key data

This section follows on from the Study's earlier analysis of objectives.

The Government's primary tool for expressing its objectives is the HLOS process. The DfT has recognised that this needs to be seen in the context of its wider strategic/policy aims. Accordingly, in 2007 the Department published its *Delivering a Sustainable Railway* White Paper to accompany the HLOS1 material. The White Paper provided a comprehensive picture of the issues facing the railway sector and a detailed explanation of the Government's aims. In line with the rest of the HLOS 1 material, however, it placed considerable emphasis on capacity investment to meet expected demand, and – while focusing heavily on the *Government's* plans – it did not outline detailed strategies for the industry. As a result, in several areas, it was not clear who was to do what to realise the Government's strategic aims.

The Study commissioned an European Foundation for Quality Management (EFQM) review of the rail sector, carried out by Investors in Excellence. This reflected a qualitative assessment against best-practice in the range of criteria covered by the EFQM model. The results of this work are discussed elsewhere in this report, but, for the purposes of this section, it is worth noting that the "Leadership and Strategy" criteria were ranked lowest overall. In addition to the EFQM analysis, the

Study has heard arguments from parties throughout the industry that there is a pressing requirement for stronger and clearer leadership and strategic direction.

In view of the Study's emerging views that the Government should place a greater onus on the rail industry to take a lead in rail delivery, and should be less prescriptive in franchising, the Study has considered the possible public response to the Government taking a less detailed role in day-to-day rail decisions, particularly those taken by TOCs. In this respect, analysis by PriceWaterhouseCoopers(PWC)/Institute for Public Policy Research (IPPR) has shown that there is already public recognition of the lead role of rail companies in day-to-day delivery (Figure 5.5).

Figure 5.5: Public accountability

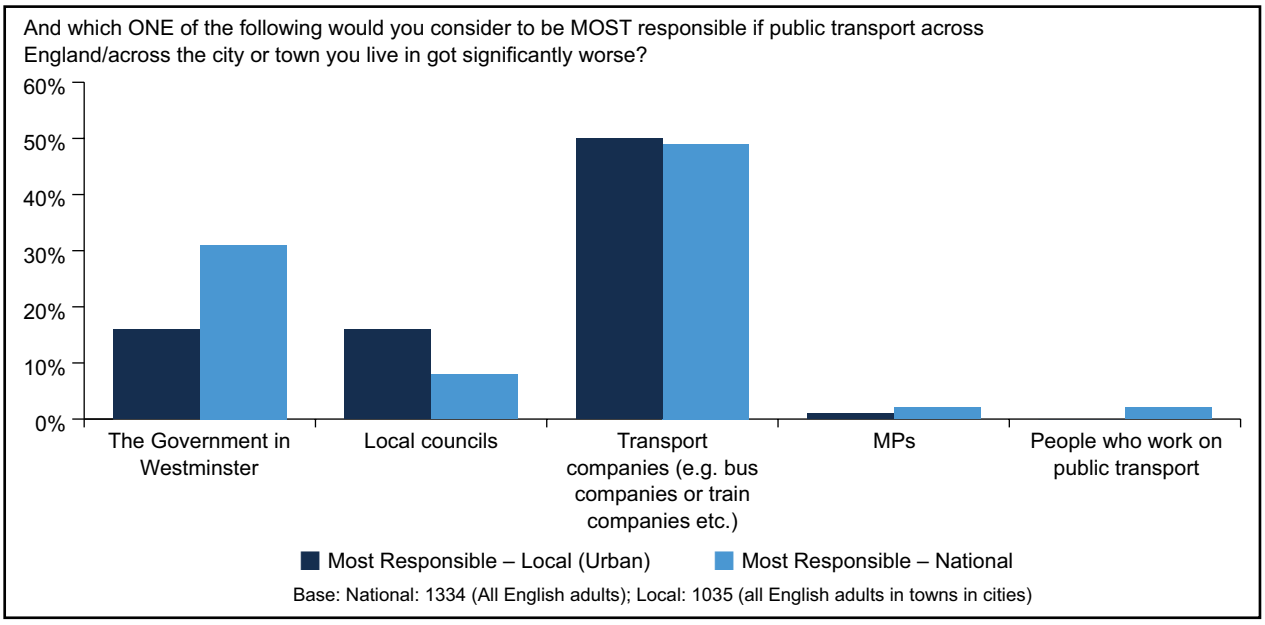


Figure 5.5 shows that:

- 48% of respondents in England said that they would hold transport companies most responsible if public transport got worse across the country, compared with 31% for Westminster; and
- at a local level, 50% of respondents in England said that they would hold transport companies most responsible in their city or town, compared with only 16% for the Government in Westminster.

The PWC/IPPR analysis is relevant because it demonstrates that already – and in contrast to the other sectors considered in that study – there is public recognition that the private sector plays a lead role in transport service delivery.

Although that work was concerned primarily with regional devolution, it has its lessons for rail. PWC/IPPR concluded that train operators are viewed differently to other providers because the public has had time to get used to the privatised system, and because they interact with them on a daily basis. This indicates that there might be benefit from the Government building on this public perception by making clearer, publicly, the extent and limits of its involvement, and where it expects the industry itself to take responsibility.

5.2.4 Barriers to efficiency

Lack of a whole-system approach

Bodies such as the DfT, the ORR, NR and TOCs inevitably have different roles and business models. However, in order to have the right strategic framework for cost reduction it is essential to have a clear whole-system approach to developing strategies for an effective and efficient rail network.

Detailed recommendations as to how to address these barriers relative to asset management and programme management are outlined in Section 9 of this report. For the purposes of this section, it is important to note that the way strategies are currently framed, or not framed, prevents the setting of a clear strategic framework across the industry generally.

Government is often too involved in detailed strategic decisions better left to the industry

There is a blurring of the line as to where the role of Government ends and that of the private sector begins, with central Government often setting detailed strategies in areas where the private sector would be better placed. Steer Davies Gleave, in their work on leadership, planning and decision-making, concluded that "changing decisions, and lack of clarity over strategic leadership, have undermined some aspects of the HLOS process (with changing decisions on major strategies changing shortly after the first HLOS had been completed)".

A symptom of this, and itself a barrier, is that the sector is slow to embrace technological change in some areas (e.g. Smartcards), but over-hasty in others (e.g. "moving block signalling").

5.2.5 Principal issues

The roles of Government and industry

For the future, a distinction should generally be made between **what** the industry should deliver (which is for Government to determine) and **how** it should be delivered (which is generally for the industry to determine).

A key feature of a strong whole-system approach would be a clear "line of sight" traced back from outputs "on the ground" through to strategies, objectives, policies and a clear vision for the industry. Government should set the framework for that in line with the recommendations the Study has made in relation to the objectives above. It could do this by publishing a revised version of the DfT's White Paper *Delivering a Sustainable Railway* (2007), identifying its vision, policies and objectives, explaining the rationale and prioritisation for those objectives, and expressing its longer-term aims (i.e. over a 20–30-year period).

It is essential that the industry takes a stronger role in developing strategies to deliver the objectives set by Government. Such strategies need to include planning for cost reduction, meeting capacity demands, improving safety performance, new technologies and other industry-wide requirements. Industry strategies would need to be developed through interaction between industry, the ORR and Government.

An issue that arises in the development of strategies and in defining detailed outputs (covered later in this section) is the perception – by Government and others – that Government must inevitably become deeply involved in the detail of such things because it will ultimately be held accountable. A key challenge here is to define clearly the role of Government, enabling it to

devolve responsibility. Under such a model the DfT would retain some involvement in strategies where there is a clear cross-industry and/or cross-modal perspective, or in cases where the scale of Government investment justified close involvement – for instance, in relation to the InterCity Express Programme (IEP) programme. However, more detailed strategies for implementation would be for the industry to develop.

The willingness of industry to embrace a more proactive role is crucial for this model of working, as the extent and speed of Government's disengagement from detailed involvement will depend principally upon how quickly the industry takes on more proactive responsibility for its affairs.

The scale of this challenge should not be underestimated, despite the PWC/IPPR findings highlighted above, as it requires the Government to delegate responsibility in areas where it currently *is* held fully responsible (such as decisions relating to franchise specifications). Reforms recommended elsewhere in this report are intended to facilitate that.

5.2.6 Recommendations – for cost reduction

The Study recommends that:

- the DfT should publish a revised version of the DfT's *Delivering a Sustainable Railway* (2007), setting out the policy direction and objectives for the industry, explaining its rationale for the objectives it has specified, and detailing as to how it will measure success – a key feature of the document should be a clear statement as to which decisions and strategies are for Government and which are for industry;
- industry should develop a set of strategies that can deliver the overall Government policy aims and objectives, particularly those for cost reduction;
- a precursor to this would be the creation of a Rail Delivery Group (see Section 6); and
- the DfT should also, in conjunction with the ORR and industry, review periodically (perhaps at each HLOS iteration) the efficiency and productivity of the railway system as a whole, and address any changes in scope required.

5.2.7 Potential for, and timings of, cost savings

The recommendations in this section are very much enablers for the whole-system approach envisaged by the detailed measures/savings outlined later in this report.

5.2.8 Implementation plan

The DfT would need to start revising the HLOS/SoFA documentation and drafting an accompanying strategic statement from 2011/12 to help shape the 2014/15 to 2018/19 Control Period, and to be reflected in franchises to be let from 2012/13.

5.3 Outputs

5.3.1 Description of studies and analysis

The Study has considered how objectives and strategies are turned into detailed outputs, specifically in relation to *what* outputs the Government procures and *how* it buys them.

The Study has carried out extensive research and has held a number of workshops and interviews with relevant industry parties, with a view to identifying opportunities to improve value for money across the industry.

5.3.2 Evidence base

The primary sources of evidence for this area of the Study were:

- Booz and Company (2010) *Costs of Railway Outputs*;
- Booz and Company (2011) *Rail Value for Money Study: Research on VfM Assessment*;
- Steer Davies Gleave (2010) *Leadership, Planning and Decision-making*;
- Department for Transport (2007) *Delivering a Sustainable Railway*;
- PriceWaterhouseCoopers/Interfleet/Buchanan (2011) *Research Project on Unit Costs and Franchising; Study 10002*;
- Jacobs Consultancy (2011) *Reviewing the Franchise Map*;
- Department for Transport (2011) *Reforming Rail Franchising: Government Response to Consultation and Policy Statement*;
- Nichols (2010) *Comparison of Railway Enhancement Costs in Great Britain and Barriers Preventing Delivery of Station Projects by Train Operators*; and
- National Audit Office (2008) *Letting Rail Franchises 2005–2007*.

In addition, this area has been informed by stakeholder working groups, discussions with relevant industry parties, and submissions received from interested parties.

5.3.3 Background information and key data

There are three types of outputs delivered by the rail sector:

- HLOS-related outputs delivered by NR;
- market-driven outputs delivered by Freight Operating Companies (FOCs), open-access TOCs and, to some extent, franchised TOCs for the benefit of their shareholders; and
- DfT/HLOS-driven outputs delivered under contract by franchised TOCs.

Owing to the complexity of the rail sector, and the nature of the franchise process, the second and third of these bullet points have tended to become intertwined in the period since privatisation.

NR outputs

The process by which NR's outputs are set follows from its status as a regulated monopoly. NR's outputs stem from the HLOS process, within which the ORR – after taking account of the HLOS outputs set by Government, the funds available, and analysis of potential efficiency – derives a series of top-level regulated outputs, enforceable under the network licence. Outputs at a more disaggregated level are established by NR consistent with the final outcome of the current periodic review and are then published in the company's Control Period delivery plan. These have the status of "customer reasonable requirements" and are, accordingly, also enforceable under the network licence.

By setting outputs in this way, the ORR seeks to ensure that NR meets the requirements of funders and customers, but also seeks to maximise flexibility. Allowing the company rather than the ORR to set detailed outputs gives NR scope to innovate and reduce the costs of meeting Government output requirements. Allowing these outputs to change gives NR scope for improving efficiency during the Control Period to reflect changes in circumstances and knowledge. This is further assisted by the HLOS fine-tuning process which allows train operators to deliver outputs on NR's behalf, where this is more efficient.

TOC outputs

TOC outputs are largely set by the franchise process through which they contract with the DfT. Through this the Government seeks to encourage TOCs to pursue market-driven outputs, while delivering – at a price decided by open competition – a series of DfT-driven outputs. In this way Government aims to purchase the following outputs through subsidy:

- running services whose revenue does not cover operating costs;
- lower fare yields than are economically justified on services in parts of the country;
- infrastructure works to make stations and rolling stock accessible (e.g. as required by Disability Discrimination Act (DDA) legislation);
- other enhancement projects which may have a positive economic case, but which lack a financial case;
- "soft quality" improvements, ranging from cycle facilities to better integration between modes, which have wider societal benefits but would not otherwise be financially viable from a TOC's perspective; and
- cleaning, maintenance and service standards at levels above those which are commercially necessary.

Some of these non-market activities contribute to economic growth and competitiveness, while others are the result of social policy (stated or implicit). Those parts of the railway generated by the latter are sometimes referred to as the "social railway".

5.3.4 Barriers to efficiency

Fragmentation, misalignments and weak incentives constrain NR's ability to deliver cost reduction

Analysis carried out for the Study has highlighted a number of barriers to value for money in the way NR outputs are procured, including:

- split of industry responsibilities and regulation, between TOCs (franchised by the DfT) and NR (regulated by the ORR) – this can lead to few effective incentives across the wheel/rail interface;
- risk protections within franchise agreements – TOCs are protected from changes in NR costs, meaning they are not incentivised to encourage NR to pursue the most cost-effective, whole-system, solutions;

- lack of customer-driven relationships and partnerships through the supply chain – supplier management tends to be driven by contractual imperatives, and is further influenced by the unbalanced relationship between NR and the large number of much smaller train operators; and
- NR is generally subject to weak financial incentives and it benefits from a Government guarantee of its debt through the financial indemnity mechanism – this results in only limited incentives to outperform regulatory targets and to minimise costs.

The franchise process constrains private-sector innovation and provides weak efficiency incentives

Analysis carried out for the Study, and feedback from workshops and interviews, has identified that the current DfT procurement model of short franchises, with detailed specifications, provides weak incentives for TOCs to tackle unit costs.

At present, franchise bidders appear to focus primarily on revenue maximisation (where risk is shared with the DfT) and less on cost reduction (where risk stays with the TOC). During the course of a franchise, TOCs will tackle some "controllable" costs (HQ, overheads), but have generally been unwilling/unable to tackle more fundamental cost factors (e.g. working practices, rolling stock). A result of this is that their cost base tends to be relatively inflexible (excluding NR charges – but including electricity for traction – TOC costs are split: 37% staff, 26% rolling stock, 4% electricity and 33% other). Of these, electricity costs are largely related to rolling stock type and usage, and staff/other costs are fixed through timetables, service patterns and a perceived inability to revise terms and conditions. An unwillingness to propose radical cost reduction, or to generate them during the course of the franchise, seems to stem from the following:

- the heavily specified way in which contracts are designed and managed, constraining scope for TOCs to generate cost-cutting or revenue-generating options;
- TOCs exploiting mid-franchise renegotiations (e.g. to accommodate DfT changes to specifications as a fruitful way of generating increased revenue);
- relatively short franchise lengths acting as a disincentive to invest heavily for future savings (although it should be noted that, even under current arrangements, unit costs have remained fairly constant whatever the franchise length or revenue support arrangements); and
- if revenue does fall, and TOCs enter revenue support, they will reduce overhead costs where they can, but have little incentive to increase revenue.

The current franchise map may not be optimised to achieve value for money

There is also some evidence that the current size and alignment of franchises might, in itself, present a barrier to efficiency – by hampering economies of scale, reducing resilience and/or reducing the opportunity to offer more integrated service patterns.

Centrally specified franchises limit the ability of regional/local bodies to make trade-offs with other modes

The Study has heard arguments, principally from the Passenger Transport Executives (PTEs), that the current franchise process stifles scope for local trade-offs and integration with other modes. Analysis carried out by the Study indicates that the current, centrally procured model (particularly in relation to the Northern and TransPennine Express (TPE) franchises) presents a barrier to

achieving the benefits that such trade-offs might bring, but achieves certain benefits relating to network integration and national priorities (see below).

Lack of clarity over commercial and social outputs means that the DfT may specify more outputs than is necessary to deliver its wider aims

This is because each franchise largely "inherits" the previous service specification and, while increments to that may be assessed in value for money terms, the base network itself is never subject to a detailed assessment. It is therefore difficult to distinguish the commercial and social parts of the railway. This is further complicated by the fact that, even within parts of the network, there may be routes which seemingly offer poor value for money, but which (because, for instance, they fit with wider rolling stock diagramming) might be financially viable even in a wholly commercial network.

This represents a major barrier because, if it were possible to separate out the "commercial" railway from the "social" one, it would be much more straightforward for the Government to "baseline" the commercial railway (free to the taxpayer) and then add whatever it was prepared to purchase incrementally (paid for with subsidy).

5.3.5 Principal issues

Stronger TOC/NR alignment

The barriers highlighted above stem principally from the lack of strong incentives and alignments to deliver further efficiency in relation to outputs. Detailed proposals for addressing these issues are outlined in Section 6. The key issue for this section is that there should be stronger alignment between TOCs and NR to incentivise co-ordinated action on the delivery of both parties' outputs.

Stronger alignment of incentives, with TOCs not being held harmless by Government for changes in fixed track access charges, would mean that this part of the supply chain functions according to normal market mechanisms. With the right incentives, TOCs would question the need for infrastructure spend, consider how investments might be prioritised to maximise value, and work with NR to avoid over-specification ("gold-plating") and inefficiency.

Franchise incentives to tackle costs of outputs

The Study has concluded that less specificity in franchise procurement could help address the barriers highlighted above, allowing TOCs more scope to flex their outputs, and hence their costs, in response to passenger demand.

Moving to **output-based franchises**, with stronger incentives, alignments and flexibilities, would encourage more effective actions to tackle unit costs (although it should be noted that, because TOCs generally compete *for* the market rather than *in* the market, they will never operate wholly like "high-street companies" and are always likely to require some element of contract management/regulation).

Under such an approach the DfT would be more flexible about which outputs it procured, depending on TOC markets. This could take a variety of forms:

- based on the same number of services as the previous specification, but with bidders having flexibility over detailed stops etc. (which is the DfT favoured approach on the West Coast);
- based on fewer services than previously, where the DfT is prepared to accept reduced services;
- specification of off-peak services only, accompanied by crowding output measure for peak services (which is better suited to commuter TOCs); and
- other options, such as customer satisfaction/mystery shopper metrics, or reliability levels, or cost-reduction targets. Such cost-reduction profiles could be based on a disaggregated target fitting with a revised HLOS/SoFA output.

Bid award would be based mainly on price as long as TOCs could demonstrate that they will achieve the basic output being purchased. Bidders would be given maximum flexibility to design the most commercial service, and would be free to amend timetables during the life of the contract as long as the contracted output measures were met.

Existing mechanisms to allow operators to amend services would need to be streamlined, possibly along the lines of a model proposed by PWC/Interfleet/Buchanan (Option A1 of *Research Project on Unit Costs and Franchising; Study 10002* (2011)), whereby limits on changes to services are set by reference to a framework which specifies that:

> *"Where there is an adverse impact on any passenger group it must be no greater than the specified limits and is only allowed to facilitate a greater improvement elsewhere ('the greatest good of the greatest number'). This needs to be supported by demonstration of how impacts on any 'losers' are mitigated."*

The Study also feels that there is merit in an alternative procurement model based on **price-based franchises**. Under this model, the DfT would procure services based on a minimum specification of essential services accompanied by a funding envelope.

Bidders would then propose their own service specification within that funding envelope, with the franchise awarded on the basis of an assessment of TOC train service plans, and the value of services offered. The DfT would set the budget guideline from the start, possibly with a declining profile to represent a "stretch target" of anticipated unit cost reductions and revenue growth. This approach would encourage innovation at bid stage, but would require a strong bid assessment process and an effective in-franchise change mechanism.

The relative merits of these approaches are shown in Table 5.1.

Table 5.1: Franchise model comparisons

Franchise model	Pros	Cons
Current model (prior to DfT reforms announced in 2010/11) Largely based on previous specification, with some output measures, such as reliability. Bidder's detailed plans are contractualised	Provides certainty as to *what* the DfT is buying Clarity for bidders on how to win the competition Has driven strong reductions in the price of bids received against guideline budgets Provides an element of funding stability, once contracts are signed	Does not provide clarity as to *why* outputs are being purchased Arguably leads to cost pressures in-franchise if trading conditions worsen and revenue does not underpin contracted outputs In negative economic conditions TOCs can enter revenue support which reduces incentives to increase revenue Constrains TOC's ability to innovate in relation to service spec, especially in-franchise
Output-based Flexibility about which outputs to buy, depending on TOC markets. Procurement would be based mainly on price as long as TOCs could demonstrate that they will achieve the basic output being purchased. It would retain an element of deliverability assessment	Should lead to reduced costs More scope for TOCs to cut costs before seeking revenue support – therefore more budgetary stability for the DfT Gives the TOC ability to innovate in relation to service specification Requires careful consideration as to what outputs are being purchased (to address possible perverse incentives)	Less certainty as to the detail of what the DfT is buying TOC ability to innovate in relation to service spec is dependent on what output is being sought Potential for sub-optimal service patterns, optimised only for revenue generation In-franchise cost reduction might need to be incentivised by a cost-reduction trajectory, monitored through five-year reviews, with possible sanctions if not delivered

Franchise model	Pros	Cons
Price-based Bidders would propose their own service specification above the minimum and up to the limit of the funding envelope Procurement would be based on an assessment of TOC train service plans, requiring the DfT to devise a detailed system that awards points or monetised value for all features of the service plan. Because the winning bidder's detailed service plans were the key element in winning the bid, these would be contractualised in detail	Creates stability for the DfT Encourages TOCs to innovate, at bid stage, and gives a more commercial approach for services outside the minimum spec "social railway"	Uncertainty at time of bid as to what the DfT is buying Carries an important challenge for the DfT in setting the budget – risk of under, or *over* provision (e.g. budget would still need an accurate assessment of what service patterns are likely to cost) Requires an ability to compare widely differing service specs – therefore needs well constructed out assessment metrics to avoid perverse incentives (operators would optimise their specs to fit with metrics) Needs a very strong change mechanism. May *require* five-year reviews Potential incentive for TOCs to design services to be abstractive

Other potential ways to improve incentives to tackle unit costs are as follows (it should be noted that, in parallel to the work of this Study, the DfT have already announced their intention to proceed with a number of the measures highlighted below).

Longer franchises

Although it could be argued that shorter franchises provide strong value for money through regular testing of the market and less risk arising from long-term uncertainties, the Study has concluded that longer franchises would give TOCs a greater incentive to innovate on services, and to make investments with a payback beyond existing franchise terms. TOCs would have more incentive to address difficult industrial relations challenges or to invest in infrastructure.

In addition, fewer franchise competitions would also produce savings – to TOCs and the DfT – from fewer bid competitions. A potential risk exists with this approach in that the longer franchise continues, the more there is a possibility that revenues and cost projections drift away from the original business model at bid stage, undermining that TOC as a viable business and risking default. The Study feels, however, that this risk could be mitigated by other measures outlined below aimed at giving TOCs more flexibility/resilience.

Ensuring TOC flexibility/resilience

A potential way to address some of the risks highlighted above is by adopting an approach recommended by PWC/Interfleet/Buchanan – i.e. that the ORR should carry out five-yearly (or other) reviews of outputs and payments to "re-base" TOCs' financial positions, making it possible to take account of exogenous factors, to set a fair price for the latest HLOS changes, and to benchmark TOCs' performance on unit costs.

Under such a model a TOC would remain on risk for the things it controls, such as marketing, cost-efficiencies and changes to services. But the ORR would use comparative data from across the industry to make an assessment of the costs or benefits which would fall to an efficient operator in relation to those areas outside a TOC's control – e.g. fare changes and HLOS, and other output changes. As far as possible, TOCs would be on risk for these things between reviews.

The study considers that this approach has considerable merit, as it:

- protects TOCs from change outside their control (negating the need for any bespoke revenue support arrangements);
- provides a relatively strong unit cost reduction mechanism (even where franchises might have contractualised cost-reduction targets);
- benchmarking, especially if made publicly available, could provide a spur to "outperformance" against the target; and
- places arbitration and negotiation further away from Government in line with the analysis above on Strategy.

That said, it has two potential risks in that:

- TOCs may perceive it as traditional regulation, similar to that in the utilities sector, and it might detract from the market-driven approach this Study seeks to encourage; and
- the DfT might continue to bear the risk of reduced outputs and increased costs if the ORR's response to a TOC's deteriorating financial position involved reverting to the DfT with proposals for reduced outputs or increased funding. This raises capability issues for the ORR, and the need for a process which ensures that such demands are contained.

These risks would need to be addressed in the implementation of any revised arrangements.

Ensuring that industry responsibilities are allocated to those organisations best able to manage cost and risk

Alongside other proposals to give TOCs more freedom/flexibility, the Study has concluded that TOCs may be better placed to price and manage some other risks. The transfer of responsibilities should be considered in the following areas:

- Asset management at some stations where responsibility is currently split – with increased clarity of responsibility, TOCs could make asset management decisions to optimise benefits to passengers.
- Enhancements to stations, where TOCs might be better placed to achieve business requirements at minimum cost based on closer understanding of passenger needs, and could drive down on scope creep.
- Involvement in specification of some new infrastructure.

Up-front payments

PWC/Interfleet/Buchanan (Option B2 of *Research Project on Unit Costs and Franchising; Study 10002* (2011)) have suggested a process whereby bidders would be required to offer an upfront capital sum to "buy" the business for the franchise period rather than bidding an increasing profile of franchise payments. The aim of such an approach would be to improve the financial robustness of franchises, and improved risk allocation and management.

The Study considers there is merit in this approach, although it notes that, for such a process to work, other measures highlighted in this report would need to be in place to allow TOCs to manage their investments and risks more effectively. It would also be important to ensure that, on any given franchise, up-front payments were pitched at such a level so as not to provide a significant barrier to entry for potential bidders.

Scope to achieve improved value for money through extending local involvement

The Study has reviewed the scope for further devolution of responsibility, particularly with regard to the PTEs covered by the Northern franchise. Currently, different arrangements are in place for different PTEs, with the basic premise being that the DfT is responsible for franchising, but that PTEs can propose increments or decrements (Merseyrail has a fuller devolved status).

There is substantial scope for devolution of budgets and decision-making to make better use of the following:

- Local knowledge of spending trade-offs and hence mode substitution, and the potential for improved train utilisation through better integration with other modes and services in the local area.
- More local market focus, e.g. in relation to fares and stations.
- Local terms and conditions, e.g. more use of driver-only operation or the use of tailored rail standards.
- Such arrangements might generate innovation in franchising.
- There might be stronger political/local buy-in (e.g. for decisions on converting rail to light rail or bus) if decisions were made locally on behalf of local tax-payers.

However, these potential benefits are offset by significant barriers. Table 5.2 highlights these, along with possible mitigations/solutions.

Table 5.2: Barriers and mitigations for regional devolution

Barrier	Possible mitigation/solution
Loss of economies of scale and density	Not relevant in bigger cities and may not be true of very small areas (e.g. single route)
Transition costs	Can be combined with franchise re-lets – the Northern franchise re-let being the main opportunity
Loss of alignment between service provider and infrastructure provider	There would be some opportunities to address this as part of NR restructuring
Failure to optimise network (e.g. for freight)	A rational route packaging approach
Spreading and thinning of procurement expertise	Create centres of excellence to act as procurement agents (e.g. DfT or larger PTEs such as Transport for Greater Manchester)
Increase in overheads and organisational boundaries	In generating proposals, benefits of devolution must be demonstrated to cover transaction costs – no dowry for overheads
Inability to co-ordinate, especially across borders, because of widely different priorities of local authorities/ PTEs/regions/HMG	Would require very careful consideration when drawing up franchise agreement(s)

More fundamentally there is a need to establish a framework that makes clear:

- the extent to which there can be a meaningful common agenda between national Government (which currently has a clear focus on reducing the cost of the GB railway) and the PTEs and local authorities (whose priorities may be increased services and/or lower fares in their areas); and
- what would be required to create groupings of PTEs and/or local authorities with the capabilities and governance structures to interface effectively with franchise or route geographies.

A resolution of the above issues would open the way for greater localism, with more involvement in England of local authorities and/or PTEs and with local decision-making brought more closely together with budget responsibility and accountability.

The Study is aware of the DfT's discussions with PTEs on alternative models of franchising that could fit with a more devolved approach. The Study supports continuation of this work on franchising models and development of an overall conceptual framework, with a view to possible first application on the re-franchising of Northern.

It should be noted that, even without devolution, there could be merit in introducing, as a precursor to procurement, stronger incentives for PTEs to propose efficiency measures and to

receive a share of benefits. In addition, there may be scope to allow local bodies other than PTEs to offer similar increment and decrement incentives to encourage greater localism.

The Study's recommendations related to the lower-cost regional railway (Section 19) represent a further area that would benefit from greater local engagement.

Franchise re-mapping

The Study has considered ways to address the potential barriers highlighted above, and to improve value for money through a re-mapping of franchises, balancing such issues as economies of scale, reduction in overlapping routes through network rationalisation, savings in the re-franchising processes avoided, and potential disbenefits from a reduction in local focus.

The Study has considered the following options as potential opportunities for selective re-mapping:

- combining the Northern/TPE networks;
- combining the First Capital Connect/Southern networks; and
- combining the Greater Anglia/C2C networks.

The practical and procurement challenges, the (potential) implications of further devolution to the local bodies and – most importantly – the complex implementation issues associated with carrying out other reforms arising from this report, mean that the DfT would need to consider re-mapping issues on a case-by-case basis and within an overall procurement strategy. For instance, the Greater Anglia and C2C networks are largely self-contained and might offer fewer operational synergies in their own right, but such a merger might become desirable in the context of a more radical approach to the overall network – such as vertical integration.

Commercial trade-offs against social outputs

A key issue is how to differentiate between market-related outputs (TOC-driven) and Government-specified ones. Section 27 of this report considers some longer-term options in this respect. In the meantime, the reforms proposed in this section are intended to give greater opportunity to TOCs to use their knowledge of local markets to shape detailed outputs. In this way, the current process would be better optimised to achieve value for money, and contain stronger incentives to maintain output levels by driving down costs.

5.3.6 Recommendations – for cost reduction

The Study recommends the following measures, a number of which have already been announced by the DfT as part of its proposed reform of franchising. It should be noted that, given the range of local circumstances and markets, a "one size fits all" approach to franchising is unlikely to work. The list below therefore represents a *menu* which the DfT should consider in relation to every individual procurement:

- stronger alignment between TOCs and NR (see Section 6), with TOCs not being held harmless by Government for changes in fixed track access charges;
- longer franchises (at least 15 years), further optimised by the DfT making greater use of residual value mechanisms;

- removing or modifying revenue support mechanisms to avoid them acting as a disincentive to TOCs to grow revenue;
- a move to franchise specification which includes stronger incentives for unit cost reduction based on one of the following models;
- use of output-based specifications, with a DfT minimum specification, supplemented by:
  - a change mechanism setting parameters for TOC-generated changes;
  - more use of output measures on crowding and customer satisfaction (e.g. the use of passenger satisfaction/mystery shopper measures rather than the specifying standards of cleanliness/staff training); and
  - a contractualised unit cost reduction profile;
- use of price-based specifications, with TOCs bidding service patterns to a strict funding envelope, and a minimum specification;
- adopting a model whereby five-year (or other) reviews of outputs and payments are carried out by the ORR. Such an approach should be implemented in such a way as to ensure "light touch" regulation of TOCs and to avoid substantial renegotiation (albeit via the ORR) with the DfT of outputs and revenues. The review mechanism would be used for the following:
  - for all franchises – to address exogenous factors, and to price-in HLOS, fares and other changes; and
  - for price-based franchises, and those with contractualised unit cost commitments, to provide a publicly-available assessment of their performance;
- the use of up-front payments as an alternative to the current use of performance bonds and parent company guarantees;
- allowing TOCs to take responsibility for key facilities including stations;
- allowing TOCs to compete or co-operate with others to deliver enhancements;
- in markets where there is competitive pressure on TOCs, the DfT could, as part of a wider review, consider giving them more freedom to set fares (see Section 8);
- the DfT to continue development of a conceptual framework and options for alternative models of franchising which could facilitate a greater level of devolution to PTEs and/or local authorities – pending decisions on the feasibility of such approaches, particularly in relation to the re-franchising of Northern, opportunities should be taken to increase the level of local engagement in franchising and other decisions with major local impacts;
- the DfT should explore the scope for giving more opportunity for other local authorities/bodies to propose increments/decrements to franchises, in line with the current PTE model; and
- in implementing other reform proposals from this Study, the DfT should review the shape of the current franchise map with a view to making the following changes to the franchise map:
  - the potential for a combined Northern/TPE franchise;
  - the potential for a combined Southern/FCC franchise; and

– the potential for a combined Greater Anglia/C2C franchise (noting that the case for this is not very strong in its own right, and might only be pursued in the context of wider reform to the TOC/NR interface).

5.3.7 Potential for, and timings of, cost savings

In themselves, the recommendations above are very much enablers for the detailed measures/savings outlined later in this report. That said, a number of savings would result directly from these measures;

- franchise remapping – savings of between £15m and £38m per year by 2018/19; and
- more TOC flexibility over service specification, soft quality and the removal of disincentives arising from current revenue support mechanisms – savings of up to £73m per year by 2018/19.

5.3.8 Implementation plan

The DfT should begin implementing the above proposals immediately, with a view to incorporating them within the currently planned re-franchising programme. The first opportunity would be to begin implementation with the West Coast franchise due to start in 2012 (and currently being procured).

If proposals were adopted for giving the ORR a stronger role in reviewing TOCs, urgent action, starting in 2012, would need to be taken to formalise that role and build capability to ensure the process was fit for purpose for the 2013 round of franchises. At the same time, steps would need to be taken to ensure that the DfT retained sufficient capability to carry out the franchising task effectively.

Any proposals for remapping/devolving of the Northern/TPE franchise would need to be ready for procurement to start in 2012, with TPE extended to fit with a 2013 re-let.

6. Area B – Leadership, planning and decision-making

6.1 Leadership

6.1.1 Description of studies and analysis

This section of the Study considers how better leadership can improve value for money in the rail industry.

Leadership is defined as "How the behaviours and actions of the [industry] create the culture, values and overall direction required for long-term success."[27]

Good leadership requires a clear well-communicated vision. Good leaders are agents for change and inspire and motivate. Leadership does not necessarily require a single leader, but in a large complex company or industry leadership is required at multiple levels.

The Study commissioned two pieces of work to examine industry leadership. The most substantial piece of work was on leadership, planning and decision-making commissioned from consultants Steer Davies Gleave (SDG). This piece of work undertook a number of activities to assess industry leadership, including:

- review of previous work;
- mapping and assessment of current leadership, planning and decision-making;
- interviews with more than 20 key stakeholders;
- case studies of industry leadership, planning and decision-making on the West Coast Main Line and Windermere branch;
- review of best-practice in the rail industry based on case studies for France and Hong Kong and in other sectors (water, energy and air transport); and
- assessment of options for improving value for money through improved leadership.

The second piece of work that the Study commissioned was a whole-industry European Foundation for Quality Management (EFQM) assessment from Investors in Excellence. EFQM is a non-prescriptive framework that enables organisations to assess where they are on the journey to excellence, using a structure and scoring system against a standard set of nine criteria for excellence. This assessment involved an EFQM assessment of Network Rail (NR), a review of existing train operator EFQM assessments collated by the Department for Transport (DfT), and a series of interviews and workshops with key industry stakeholders to establish a cross-industry EFQM assessment.

27 EFQM Excellence Model.

6.1.2 Evidence base

In addition to the two studies that the Study has commissioned, the Study has also revisited the 2004 White Paper and some of the work that underpinned it. The Study has had numerous discussions and interviews with the rail industry and Government, which have helped to develop the Study's thinking in this area, and has held a number of stakeholder management groups with key industry stakeholders where the Study's findings have been subject to constructive challenge.

6.1.3 Key data

A common theme coming from the work undertaken by the Study is the need for stronger leadership at an industry level. The 2004 *The Future of Rail* White Paper identified a lack of industry leadership and recommended steps to give NR a greater industry leadership role. This has not materialised fully, perhaps partly because it was not clear what was required and partly because NR is also fulfilling a supplier relationship with Train operating Companies (TOCs) and Freight Operating Companies (FOCs). The result, at times, could be perverse, with the supplier leading (or trying to lead) a large number of customers whose views often differ. As a result, a range of issues identified in the White Paper still appear not to have been resolved:

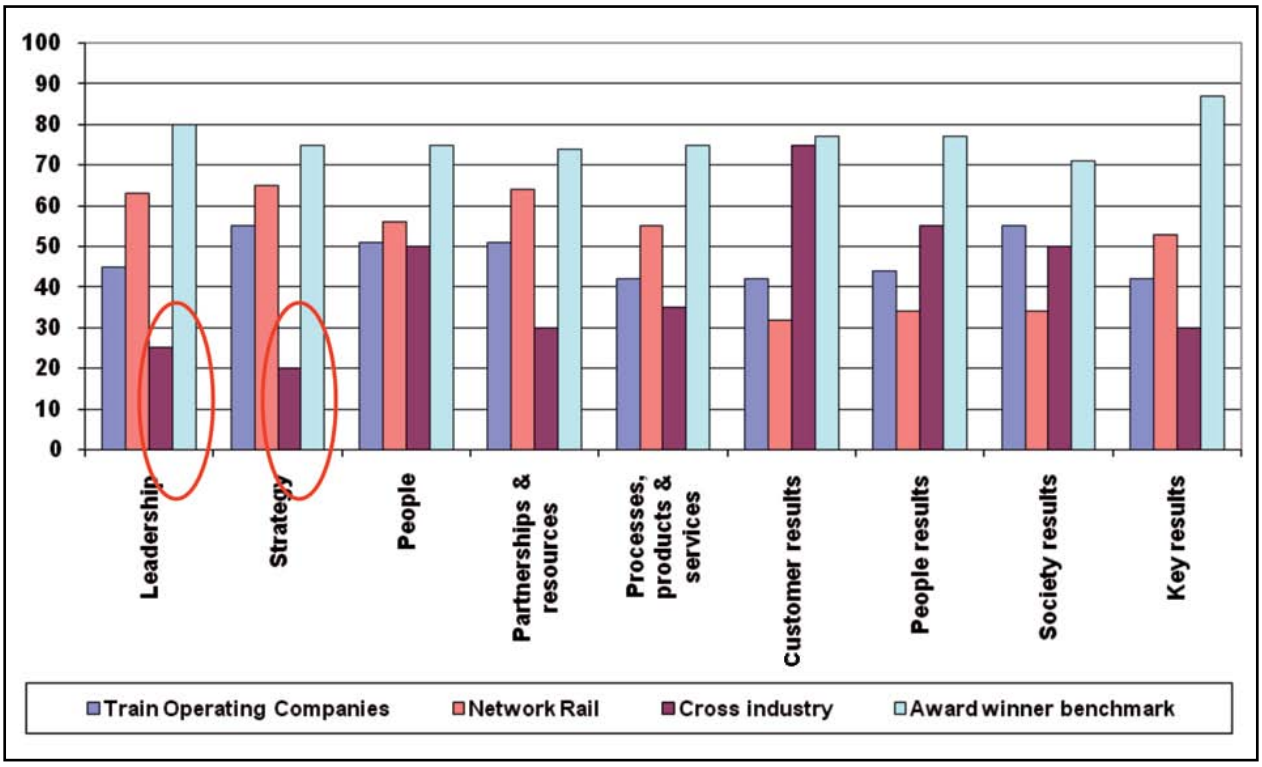
- "the lack of any single body with operational responsibility for the whole railway at a national level lies at the root of many problems";
- "planning and decision-making responsibilities have been dispersed across the whole-industry"; and
- "complex and confusing public-sector structure, with too many overlapping responsibilities and no clear command of strategy".

This set of problems has again been highlighted by the whole-industry EFQM assessment that the Study initiated, which found that:

- "There is no recognisable industry leadership and consequently there is no cohesive vision and industry strategy for the future. This is the most significant improvement opportunity for the GB rail industry."

Figure 6.1 shows the EFQM summary for the whole rail industry. This shows that, while the scores for the separate organisational groups are reasonably satisfactory, there are seen to be significant weaknesses in leadership, strategy and partnerships when assessed on a cross-industry basis.

Figure 6.1: EFQM assessment of GB rail industry[28]



Source: Whole-industry EFQM assessment.

In a separate analysis of industry leadership, planning and decision-making, consultants SDG found:

- great uncertainty over who leads the industry and, when pressed, people generally said it was the Government, the DfT or the Secretary of State leading the industry; and
- the vacuum left by this lack of industry leadership has often been filled with civil service or political leadership. Government intervention in the day-to-day business of running the railway is at an unprecedented level.

If the industry is going to achieve the step change in cost performance that is necessary, it is likely to be essential that:

- the effectiveness of industry leadership is substantially enhanced to counteract the existing in-built fragmentation of views and effort;
- the industry takes a greater role in developing and taking forward strategy; and
- Government takes much less detailed involvement in the industry.

6.1.4 Barriers to efficiency

The key barriers to improved leadership are as follows:

- Fragmentation of the rail industry – the numerous bodies involved in the rail industry and misaligned incentives between these bodies make cross-industry leadership considerably more difficult.

28 Care should be taken with comparisons across the criteria as the scores have been generated under different evidence circumstances.

- Lack of clear industry leadership – there is a very high degree of Government involvement, coupled with an industry which is unwilling or unable to provide clear strategic leadership. It is debatable which of these characteristics is the causal factor, but it seems clear that a drive for cost reduction will only succeed if the industry takes leadership responsibility at a strategic level.
- Lack of a whole-system approach to leadership – the flow from strategy and objectives to end users is unclear. The lack of clear leadership has meant roles and responsibilities are unclear, with some parts of the industry focusing as much on the Government as on the end-user as their customer. Separation between NR and TOCs at the wheel-rail interface has led to decisions not always taking into account the impact on other parties.
- The role of Government – the Study has received many inputs suggesting that Government has taken on too great a role, with insufficient mechanisms to devolve leadership, decision-making and accountability to the industry or those closest to the market. This has, in turn, led to Government seeking to control the market at a detailed level in order to achieve better value for money, preventing the full benefits of private-sector involvement. It is also suggested that the high level of Government involvement has at times led to too great a focus on wider social outputs, which have come at the expense of higher costs and subsidy.

6.1.5 Principal issues

Some of the issues of industry leadership may be alleviated by changes proposed elsewhere in the Study. In particular, incentives to work together would be improved by exposing train operators to NR's costs through some degree of cost and revenue sharing. Changes in the franchising system could also make train operators more responsive to the market rather than Government or contractual requirements by, for example, greater flexibility in franchise contracts and longer duration contracts. However, the Study does not consider that improving incentives, on its own, would be sufficient to make the step change required in industry leadership.

The Study has identified the following key principles for industry leadership:

- Need for clarity of leadership. Cross-industry leadership already occurs on a number of issues, such as operational performance (through the National Task Force (NTF)). However, in many areas there is a lack of co-ordination across the workstreams and little clarity over where the industry is being led. Increasing the clarity of leadership does not require a single leader, but it means that leadership roles and responsibilities need to be more apparent and clearer; and industry needs to exercise a much stronger leadership role taking account of whole-system impacts.
- Industry leadership should be undertaken by the industry. This should involve train operators (including freight), the infrastructure manager and, where appropriate, the supply industry (including rolling stock), working together in partnership.
- A need to separate political leadership from industry leadership. Political leadership inevitably is subject to change, yet the focus on cost reduction requires consistency of purpose. Where Government does not need to be involved, for example where subsidy is not required, greater responsibility should be devolved to the industry.

Such principles would allow Government to withdraw substantially from responsibility and accountability where train services are being operated on a largely commercial basis, and could reduce Government involvement elsewhere in the railway. Giving the whole industry responsibility

for leadership, rather than an individual body such as NR, would ensure cross-industry buy-in and a whole-system approach to leadership.

6.1.6 Recommendations for cost reduction

Rail Delivery Group

The Study recommends that a Rail Delivery Group is established with responsibility for high-level cross-industry leadership supported in certain areas by a Rail Systems Agency. The following sections describe what the Rail Delivery Group might look like, its organisational principles, how it might be staffed and its functions. The organisational principles proposed are those that have been successful with the National Task Force (NTF), the cross-industry group that is responsible for operational performance. Ultimately, the Study considers that it should be for the industry to develop the Rail Delivery Group and the structure and functioning of the Group should reflect the views of industry to ensure cross-industry buy-in.

Credible leadership – the NTF was initially joint-chaired by senior executives from NR and a train operating company. It has subsequently been led (for roughly two-year periods) by senior TOC owning group CEOs and latterly a TOC managing director. It is essential that the leadership of the Rail Delivery Group comes from high-level industry principals.

Industry ownership – the group should be drawn from the most senior members of the industry, who are willing to commit time and associated resources into making the group a success and can help to ensure that whole-system impacts are considered. Membership of the group could be required through network and train operator licences where appropriate. Rolling stock and supply chain companies could be involved on an ad-hoc basis. Mechanisms for establishing a dialogue at industry level with trade unions should also be explored.

Scope – the Rail Delivery Group needs to provide leadership for a range of cross-industry issues, where the effectiveness of these functions could be significantly enhanced through closer involvement with industry leaders and through taking a whole-industry approach to decisions. Potential areas where the Study considers the Rail Delivery Group could add value are:

- operational performance – with the NTF reporting to the Group;
- safety performance – with a National Safety Task Force reporting to the Rail Delivery Group;
- encouraging a change of culture within GB rail – towards partnership, openness and continuous improvement;
- cross-industry planning – providing leadership for cross-industry planning by the Planning Oversight Group, with a particular focus on cost reduction; and
- tackling system-wide issues – with a Rail Systems Agency reporting to the Group.

The complexity of the rail sector, and the number of interfaces required to deliver service outputs, has led the Study to recommend the creation of a Rail Systems Agency (RSA), which will bring together the Railway Safety and Standards Board (RSSB) and the technical and professional functions of the DfT, NR and the Office of Rail Regulation (ORR). In particular, the RSA should build on the functions and successes of the RSSB, but foster stronger and more pro-active leadership and engagement from industry on issues of standards and innovation. The proposed RSA is described in more detail in Section 11 of this report.

Taking into account the extent of changes recommended by the Study, the Rail Delivery Group should perform a crucial role in leading the resulting implementation and change programme (while noting that some of this will also be for Government to take forward).

These functions would form the initial scope of the Rail Delivery Group, in addition to providing support for, and oversight of progress with decentralised and aligned NR/TOC partnerships and progress with the overall cost-reduction strategy and overall targets.

Characteristics – the Rail Delivery Group should be relatively small and light-touch and should seek to "make happen what wouldn't happen otherwise".

Clear objectives – the Rail Delivery Group needs to have clear objectives so that everybody knows what they are trying to achieve. The objectives of the Group could include industry cost reduction, cross-industry performance and other system-wide activities consistent with its functions.

Clear monitoring and reporting – a key element of ensuring that the group is a success is publishing clear data monitoring performance in terms of reducing costs. In order to establish a push for change, data need to be published probably on a railway period basis (as is performance data). The publication of the data needs to be supported by clear commentary produced by the project office, explaining period level cost changes.

Support from a project office – it is important that even in the early stages the group can undertake work itself. This would mean that the group would initially employ a small project office with staff seconded from different parts of the industry. This would work closely with the Change Team proposed under Implementation.

Clear accountability – possibly quarterly or six monthly, the group should submit a report to the Secretary of State describing progress against targets, together with forecasts for the following periods, and raising those that require wider consideration.

Enforceable decisions – much of the work of the Group would be based on consensus. However, particularly in areas such as standards and technical innovation, the group may need to make decisions where consensus may be difficult to reach, particularly where there are likely to be cost implications for one or more parties. At some stage, consideration may need to be given to means whereby decisions could be taken through qualified majority voting rather than unanimous agreement, creating faster more effective decision-making.

Status of the Rail Delivery Group – there are a number of alternative ways in which the Rail Delivery Group could be developed and each of these options should be considered by the industry:

- A voluntary, unincorporated, partnership including NR, TOCs and other rail interests. This is the approach used for the NTF and has benefits in terms of direct industry buy-in to decisions. However, decisions can be subject to compromise and it can be difficult to enforce implementation.
- A separate licensed body – this was the approach used to develop RSSB and has the benefit that decisions could be made enforceable (through train operator and NR licences, with the opportunity for appeal), although decisions could be removed from the industry (as the Board of the Group could be independent, as in RSSB).; and
- A statutory body – such as the British Transport Police. Again this would be easier to enforce decisions, although these could be even further removed from the industry.

The Study recommends the first of these options as the first step. The Study does not consider that the Rail Delivery Group should be part of any existing organisation.

Supporting incentives

For leadership to be effective, it is important that the Rail Delivery Group is supported by aligned cross-industry incentives. Importantly, there need to be strong incentives to reduce costs which will encourage parties to work together for cross-industry reform, through the Rail Delivery Group. Further details on the Study's proposals in this area are given in Section 7.

Role of Government

As long as Government is providing significant amounts of subsidy, Government is bound to be involved in the industry's affairs. The role of Government is discussed in Section 5 of this report. In summary, Government should:

- specify how much money it is prepared to provide (SoFA) and what outputs it expects in return (HLOS), including cost objectives; and
- provide clear policy direction and high-level objectives for the industry, and should control financial outcomes against the SoFA/HLOS.

However, Government should not be involved in as much detailed specification as at present – a level of detailed involvement which it has been suggested is significantly greater than when the industry was run by the nationalised British Rail.

6.1.7 Potential for, and timings of, cost savings

While specific cost savings have not been attributed, the Study considers that changes to leadership are essential for the savings identified elsewhere in the report to be delivered.

6.1.8 Implementation plan

The Study considers that the industry should identify and determine the most appropriate form of the Rail Delivery Group. This should pick up the change and implementation agenda resulting from the Study and should be established on an informal basis by August 2011 and formally by the end of 2011.

6.2 Planning

6.2.1 Description of studies and analysis

This section of the Study considers how better planning can improve value for money in the rail industry.

Planning encompasses the process of setting goals, developing strategies and outlining tasks and schedules to accomplish the goals. In the rail industry, each activity from longer-term strategic planning through to annual timetable development and capacity allocation encompasses a significant planning activity.

The work commissioned from SDG covers planning as well as leadership and decision-making, and included:

- review of previous work;
- mapping and assessment of current planning and cross-industry implementation processes;
- interviews with more than 20 key stakeholders;
- case studies of industry planning on the West Coast Main Line and Windermere branch;
- review of best-practice in the rail industry based on case studies for France and Hong Kong and in other sectors (water, energy and air transport); and
- assessment of options for improving value for money through improved planning.

6.2.2 Evidence base

As with industry leadership, the work has also involved a large number of interviews and discussions with key industry stakeholders and Government. In addition, the Study has also undertaken the Study's own analysis, drawing on the following reports:

- Department for Transport (2004) White Paper, *The Future of Rail*;[29]
- Department for Transport (2007) White Paper, *Delivering A Sustainable Railway*;[30]
- Selected Route Utilisation Strategies from both the Strategic Rail Authority (SRA) and NR;[31]
- Halcrow (2010) *GSM-R – Lessons Learnt on Industry Collaboration*;[32]
- Foster (2010) *A Review of the InterCity Express Programme*;[33]
- Investors in Excellence (2010) *Whole-industry EFQM Assessment*;
- SDG (2010) *Leadership, Planning and Decision-making*;
- Cross-industry Working Group (2010) *Improving Cross-industry Projects*;
- Atkins (2011) *Review of GB Rail Whole-system Programme Management*; and
- LEK (2011) *Alternative Railway Structures*.

6.2.3 Key data

Rail industry planning is complex and involves a number of different parties at a variety of levels.

At the highest level the DfT sets broad policy goals periodically in White Papers and other ministerial announcements (see Section 5).

29 Department for Transport (2004) *The Future of Rail*: White Paper Cm 6233. London: TSO. This document can be accessed at http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/about/strategy/whitepapers/previous/rail/.
30 Department for Transport (2007) *Delivering A Sustainable Railway:* White Paper Cm 7176. London: TSO. This document can be accessed at http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/about/strategy/whitepapers/.
31 NR route utilisation strategies can be found at www.networkrail.co.uk/aspx/4449.aspx. SRA route utilisation strategies can be found at http://webarchive.nationalarchives.gov.uk.
32 Halcrow (2010) *GSM-R – Lessons Learnt on Industry Collaboration*. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/enh-lessons-learnt-jul10.pdf.
33 Sir Andrew Foster (2010) *A Review of the InterCity Express Programme*. London: TSO. This document can be accessed at www.dft.gov.uk/pgr/rail/pi/iep/fosterreview/pdf/report.pdf.

The High Level Output Specification (HLOS) sets out what the Government requires from the railway and more specifically NR over the next five years The first HLOS specified output requirements from NR and train operators in terms of performance, safety and capacity, which were required to be met within Statement of Funds Available (SoFA).

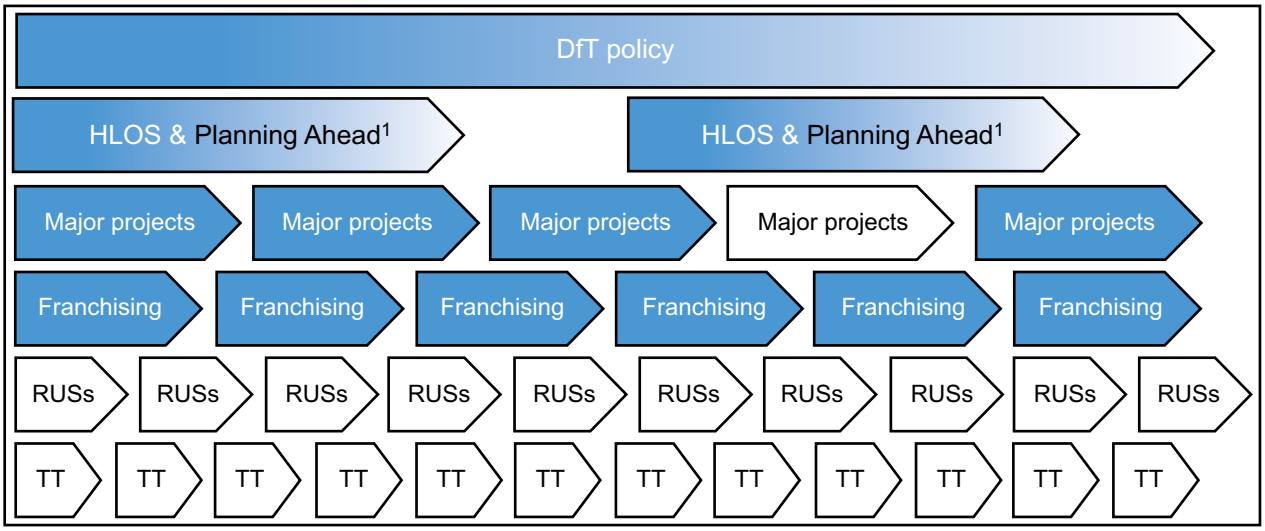
The next HLOS will be informed by a cross-industry plan (Planning Ahead) developed by the Planning Oversight Group. This Group is led by NR, ATOC (and TOC owning groups) and the Rail Freight Operators' Association (RFOA). It co-ordinates inputs from various industry forums (such as the NTF) to set out a long-term vision for the railway, and what outputs and measures will be required to meet this vision. The Group will feed into the development of NR's Industry Strategic Business Plan.

On a less regular cycle the DfT leads on franchising and also (most) major projects. This draws on DfT Policy and the HLOS, and is informed by the other processes below it in the hierarchy (see Figure 6.2)

Informing the HLOS, Planning Ahead and franchising process are Route Utilisation Strategies (RUSs). NR leads the development of RUSs, which set out cross-industry plans for the next 10–15 years for individual areas of the network. The next generation of RUSs is looking more long-term at potential requirements over the next 30 years. RUSs, in combination with the HLOS process, can be seen as a form of "predict and provide", with the RUSs setting out demand forecasts and the enhancements required to meet any resulting gaps. The HLOS/SoFA process provides the funding necessary to undertake many of these enhancements.

Below RUSs in the planning process is the timetable development process which reflects the rights in train operators' access contracts (which, in turn, reflect service levels specified in franchise agreements). In addition to the timetable, train operators decide what train formations to operate and how to resource their services.

Figure 6.2: Rail industry planning process in concept



Note: [1] Planning Ahead is undertaken by the Planning Oversight Group.

6.2.4 Barriers to efficiency

- Predominance of infrastructure solutions, relative to operational or demand management solutions, that may not reflect the best value for money solution – such solutions are often aligned to incentives and policies of industry players (including Government).
- Lack of a whole-system approach to planning – the split of responsibilities between train operators regulated by the DfT and NR regulated by the ORR means that there can be a lack of a whole-system approach to planning and decision-making.
- Weaknesses in planning – while the route utilisation strategy process has had success, notably in terms of getting cross-industry buy-in, there is still a feeling that plans tend to focus on the short term and can often be inflexible. Furthermore, planning activity is dispersed across many different industry parties (e.g. industry plans can be developed through the RUS process, the HLOS processes, the industry Planning Ahead Group, NR Route Development Plans, and Government franchising process), which can lead to duplication or confusion.

6.2.5 Principal issues

The principal issues that need to be addressed are as follows:

- There needs to be less focus on capital and infrastructure solutions. Instead there needs to be a renewed focus on making better use of existing capacity, ensuring that a full range of solutions is considered at an early stage (including demand management and pricing), and ensuring that the financial implications of any proposals are clearly understood by all parties concerned. This would require changes to the existing industry RUS planning process to ensure the early consideration of a full range of options and a change to decision-making criteria to ensure that financial impacts are clearly identified and fully understood.
- A more whole-system approach needs to be taken to planning, whereby the whole-industry costs, revenues and benefits are fully considered. The delivery of whole-system outputs needs to be consistently mandated and enforced, early cross-industry engagement needs to be appropriately incentivised and/or mandated, and good whole-system data on costs and revenues should be made available.
- Duplication in the planning process needs to be reduced or removed so that the industry is working together on one set of plans with cross-industry and Government buy-in.

6.2.6 Recommendations for cost reduction

Reducing incentives towards infrastructure solutions

To reduce incentives towards infrastructure solutions the Study considers that, in common with other transport sectors, there should be an end of "predict and provide" in the rail sector. In its place there should be a much greater focus on making better use of existing capacity, whether that is through better timetables, pricing or behavioural options, perhaps "predict, **manage** and provide".

To implement this, the Study recommends that there should be an overhaul of the RUS process. The Study understands that the ORR and NR are already reviewing the RUS process. The Study recommends that the RUS process is refocused towards better use of existing capacity and, in particular:

- identifies existing capacity utilisation and spare capacity – this will identify where existing capacity can be better utilised, help potential users avoid capacity constraints when developing new service proposals and will identify to funders where potential capacity concerns might arise in the future;
- prioritises users of the network (TOCs and FOCs) by a standard set of criteria (which could include cost–benefit analysis) so that users have clarity on what is seen as making good use of the network and what services are less beneficial;
- identifies what could be done to address future gaps between rail capability and future demand with minimal additional funding (such as that provided currently through the NR Discretionary Fund scheme) – such analysis should consider a range of options including different uses of existing capacity, pricing options (which would need to be considered in the context of a change in fares policy) and behavioural changes. This will better ensure that a whole-system approach is taken to planning. Where difficult choices are to be made, it is important that freight customers' and passengers' views are taken into account when making trade-offs;
- identifies what could be done if significant additional funding were available – this would be similar to existing RUSs and would clearly identify the alternatives to funders. As discussed in Section 9.2, this should encompass a rigorous appraisal of a number of different conceptual alternatives. If funding constraints are known, then the RUS could make recommendations on the preferred strategy for route development. Where possible this should feed directly into route plans and future Government HLOS and franchise specifications, reducing duplication. Such an approach would ensure cross-industry consistency and buy-in from stakeholders; and
- includes detailed investment, operating cost and revenue and output forecasts for proposed schemes – this will make the costs of schemes clear to funders, provide a method of monitoring project costs and outputs as schemes develop, and increase the incentives for robust cost estimates at early stages of project development.

To support better system efficiency, the Study recommends that the industry develops a metric to incentivise better capacity utilisation. Existing measures (such as the capacity utilisation index) are good at identifying where there may be spare capacity in the timetable; however, they are less suitable where a new timetable is required. Such a metric should not assume that capacity is constrained by the existing timetable.

The Study notes that the DfT is reviewing its appraisal guidance to provide greater focus on affordability and financial outcomes. Current DfT appraisal guidance uses the New Approach to Appraisal (NATA) framework to bring together the impacts of a project across a range of areas including economic, environment and society. The financial impact of the project is included in the appraisal at a high level and focuses on the calculation of a present value of net costs usually over 60 years, rather than showing explicit financial impacts in the nearer-term:

- First, the Study considers that much greater prominence should be given to the financial impact of projects within standard appraisal guidance. Rail scheme appraisals (e.g. those within the RUS process) should explicitly consider the financial benefit–cost ratio, the net incremental cost per unit of output, and the time profile of costs, revenues and benefits. This will ensure that the financial impact of a project is considered much earlier and will be critical in ensuring that industry planning processes work effectively; and

- Second, building on this, there should be a much greater focus on ex-post analysis of projects. This will compare outturn and forecast scheme costs, revenues and benefits. This will provide a further incentive for scheme providers to provide accurate cost, revenue and benefit forecasts. If forecasts are found to be inaccurate, then the DfT may need to consider making further adjustments for optimism bias or require further cost breakdowns and assumptions from promoters. These changes will help the DfT and other potential funders develop a clearer view of potential financial requirements at an early stage of project development so that there is clarity about the net impact on industry subsidy requirements going forwards.

Whole-system approach to planning

The Study recommends that the DfT sets out a long-term view that includes future output and cost recovery requirements. Future HLOSs, franchise specifications and RUSs should then be based on the DfT's long-term view, ensuring that output requirements are consistent across train operators and NR.

It is important that whole-system output requirements, for example operational performance, are consistently enforced across train operators and NR, particularly if there is going to be more flexibility over who delivers outputs. The Study recommends that there should be a single body, the ORR, to enforce whole-system outputs (such as operational performance) across train operators and NR. This is discussed further in the Regulation section (Section 26).

Early engagement between TOCs and NR is critical to identifying the most cost-effective whole-system solutions. The Study recommends that early cross-industry engagement should be mandated as part of the project development process, for example NR should provide for early TOC engagement as part of the Governance for Railway Investment Projects (GRIP) process, as discussed in Section 9.

For whole-system planning to be effective, there has to be good knowledge of costs and revenues across the whole industry. The Study recommends that the ORR should take the lead in specifying cross-industry data requirements which are required for the industry to have a more joined-up focus on costs. In the first instance this should cover the collection of cross-industry (NR and TOC) cost and revenue data to allow the publication of joint profit and loss accounts and NR and train operating cost benchmarking (further details are given in the section on financial transparency (Section 23)). Where the required data are not being made available, the ORR should take a proactive role in ensuring they are provided, possibly through amendments to licences.

Streamlining the industry planning process

Current industry planning processes include a certain amount of duplication. For example, the DfT develops specimen options to meet the HLOS so that it can identify a high-level cost estimate. This duplicates work undertaken by the industry, in particular the Planning Oversight Group. The Study recommends that the DfT should work with industry to minimise duplication.

6.2.7 Potential for, and timings of, cost savings

Specific cost savings are difficult to attribute directly to improvements in planning and decision-making, although the changes described here will be essential to the delivery of the cost savings identified elsewhere in the Study, particularly those attributed to programme management (Section 9.2).

6.2.8 Implementation plan

The Study considers that the following measures are required to implement the changes described above:

- The ORR should change the licence requirement and/or RUS criteria to ensure that a full range of options and the case of no additional funding is considered.
- The industry should develop new metrics to incentivise better use of existing capacity.
- Within the review of the NATA framework, the DfT should amend the appraisal criteria to give much greater prominence to the financial impact of schemes and ex-post analysis.
- The DfT should amend the HLOS process to focus on higher-level outputs with greater flexibility on how they are delivered and greater focus on costs.
- The ORR should become the enforcement body for whole-industry outputs and the licences of new and, where possible, existing franchised train operators should be amended accordingly.
- NR should amend GRIP so that early TOC engagement is provided for. The ORR should consider whether it is necessary to amend train operator and NR licences to ensure co-operation with data requests.

6.3 Decision-making

6.3.1 Description of studies and analysis

This section of the Study considers how better decision-making can improve value for money in the rail industry.

Decision-making can be regarded as an outcome of processes leading to the selection of a course of action among several alternatives. Within the rail industry decision-making occurs at many levels: from the day-to-day decisions made by signallers and train planners, through less frequent strategic decisions made by middle and senior managers, through to the large strategic decisions made by key decision-makers. Often in the rail industry the larger the decision, the more parties that have to be considered and consequently the more complex the decision.

The principal piece of work commissioned in this area (in common with the leadership and planning themes) was from SDG, which considered leadership, planning and decision-making, and included:

- review of previous work;
- mapping and assessment of current cross-industry decision-making;
- interviews with more than 20 key stakeholders;
- case studies of industry decision-making on the West Coast Main Line and Windermere branch;
- review of best-practice in the rail industry based on case studies for France and Hong Kong and in other sectors (water, energy and air transport); and
- assessment of options for improving value for money through improved leadership, planning and decision-making.

As with industry leadership, the work has also involved a large number of interviews and discussions with key industry stakeholders and Government.

6.3.2 Evidence base

The Study's assessment is based on the following reports:

- Department for Transport (2004) White Paper, *The Future of Rail*;
- Halcrow (2010) *GSM-R – Lessons Learnt on Industry Collaboration*;
- Investors in Excellence (2010) *Whole-industry EFQM assessment*;
- SDG (2010) *Leadership, Planning and Decision-making*; and
- Oxera (2010) *Review of Cross-industry Interfaces, Incentives and Structures*.

6.3.3 Key data

The 2004 White Paper *The Future of Rail* stated that "planning and decision-making responsibilities have been dispersed across the whole-industry. As a consequence, industry plans have often been drawn up and implemented in too slow and disjointed way." It is unclear whether the situation has improved since the publication of the 2004 White Paper.

The problems in decision-making can be illustrated by looking at the Windermere case study identified by SDG as part of its report, shown in Box 6.1. It illustrates the impact if rolling stock purchase and deployment decisions are separated from those on infrastructure, and highlights the potential significant effect that this can have on total industry costs, with little discernible benefit to the customer.

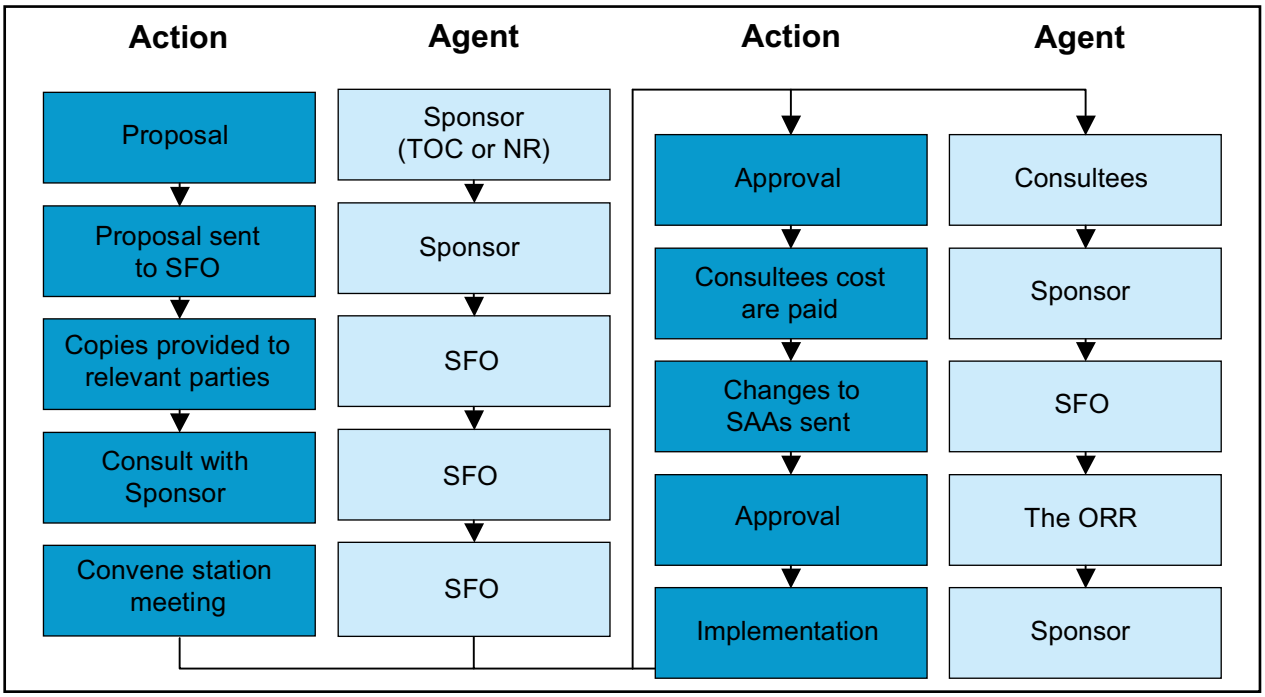
Box 6.1: Case study – Windermere branch line

The Windermere branch line is a 10-mile branch line in the Lake District. It is regarded as typical of many rural and secondary lines which have seen significant investment and a rapid change in the method of operation, but where the rationale for the investment is unclear, although this could have a long-term impact on the financial performance of the line.

Following privatisation there has been a series of investments in new rolling stock. These have increased passenger train weights progressively from 48.5 tonnes (two car) to 163.0 tonnes (three car) today, although demand rarely requires more than a single car. The new trains are so heavy that they have apparently been causing significant track damage, so much so that NR deemed it necessary to rebuild the entire branch line to a much higher standard. The Study estimates that the additional track renewal costs could be up to £5 million. There are a number of similar examples across the network.

An illustration of the complexity involved in contractual decisions can be seen in the simplified station change process shown in Figure 6.3. This shows that the sponsor of a station change, which can be as minor as the substitution of a ticket machine with a more modern equivalent, can need to go through at least 10 decision-making stages to be implemented. This does not take account of further approvals and consents that might be required for a station change, including franchise agreements, variation to station lease terms, technical approvals and external planning consents. This whole structure slows decision-making significantly and can prevent necessary changes being made to the network.

Figure 6.3: Simplified station change proposals



The Study has made a brief comparison of planning and decision-making in the GB rail sector with that in France. While the French rail sector is state owned there appears to be less central Government involvement in planning and decision-making. While planning and decision-making responsibilities are distributed across parties (SNCF, RFF, regional and central Government), there appears to be much less debate over key decisions. SNCF has considerable commercial freedom on fares and service levels (apart from regional services). This allows SNCF to try to optimise whole-system costs and income, and provides some encouragement to look for efficiency improvements.

6.3.4 Barriers to efficiency

There are a number of barriers to improving the efficiency of decision-making:

- Contractual rather than partnership based approach to relationships – industry relationships are based on contracts, for example between the DfT and train operators, between train operators and NR, between train operators and rolling stock companies, and between multiple operators in the case of certain stations rather than partnerships. This can lead to inflexibility and confrontation where key players are not necessarily or naturally involved at an early stage in processes. For example, the infrastructure manager tends not to be involved in rolling stock procurement, although this could have a significant impact on infrastructure costs.
- Overly-centralised decision-making – the high degree of Government involvement has led to too many decisions taking place remote from the market. Even where decisions are devolved to the industry, many decisions are taken centrally within businesses (perhaps particularly within NR) rather than by those closer to the market.
- Weaknesses in decision-making – where there can often be slow and ineffective decision-making due to the legal/contractual frameworks, with the need to consult and reach consensus with numerous parties.

6.3.5 Principal issues

Based on these barriers, the principal issues arising include the following:

- The need to devolve decisions to those closest to the market. This does not mean that all decisions should be made by train operators who are often closest to the market, but does mean much closer involvement of train operators and more decisions taken at a route-level within NR.
- The need to move towards partnership and whole-system thinking so that all parties have an incentive to work together to reduce whole-system costs.
- The need to improve the legal and contractual frameworks so that decisions are faster and change is easier.

6.3.6 Recommendations for cost reduction

Devolved decision-making

The key focus of the recommendations on decision-making is that, where possible, decisions should be devolved to those closest to the market. This means a much closer involvement of train operators in decisions and more decisions taken at route level within NR. In particular, this will require a number of changes identified elsewhere in the Study:

- Less prescriptive franchises to allow train operators more scope to be able to respond to the market (this is discussed in more detail in the outputs section (Section 5.3)) and with less requirement for DfT approvals of changes in franchisees' activities.
- Decentralisation within NR to facilitate the greater decision-making at a route-level, with better alignment of routes within NR and TOCs and markets (this is discussed in more detail in the structures section (Section 7.1)).
- Greater involvement of devolved bodies such as PTEs and local government, which are closer to the market than central government. The Study considers that, where an element of devolution has already occurred, and local circumstances suit (e.g. Merseyside and Wales), responsibility for infrastructure decisions could also be devolved so that the devolved franchising bodies can take a whole-system view of local priorities. The Study also considers that, where feasible, local and regional bodies should have greater involvement in specifying service levels within their local areas, and in the decisions (which balance fares and service levels with funding) that need to occur if value for money is going to be maximised.

Whole-system partnership working

Giving train operators a greater role in decisions and devolving more decisions to the route level within NR should encourage greater partnership working between train operators and NR. The Study recommends the following changes to further enhance whole-system partnership working;

- Better alignment of incentives, for example through cost and revenue sharing arrangements between train operators and NR. Section 7 describes this in more detail.
- Enhanced collaboration at industry level through the proposed Rail Delivery Group.

- A requirement for partnership or collaborative working which could be specified through amendments to train operators and NR's licences, with the ORR and DfT giving a clear leadership that such approaches are supported.
- Greater alignment of planning and operational decisions (as described in the planning section above (Section 6.2)).

Improved contractual change and consultation processes

The Study considers that the ORR should identify and develop options for streamlining industry contractual change and consultation processes. This should encompass:

- publishing a clear forward plan and outputs for policy consultations, packaging consultations were possible, and using industry groups to provide transparency and feedback on the forward plan;
- publishing defined timescales for reaching decisions following consultations and appeals, which cover the entire time period, including the time taken to obtain information;
- reviewing industry change processes to examine whether informal early consultation can be required so that industry parties have early sight of potential changes when they might be better able to influence outcomes;
- where feasible, simplifying change processes so that they use common terminology and are more readily understood by industry parties;
- reviewing whether some simple changes could go through a less complex process, and, where more complex, changes should proceed to a published timescale; and
- building on the proposed changes to station changes by considering whether to apply the same principles to other areas such as network and vehicle change.[34] This could encompass separating the change and compensation processes so that negotiations over compensation do not hold back changes that are agreed to be necessary.

6.3.7 Potential for, and timings of, cost savings

Specific cost savings are difficult to attribute directly to improvements in decision-making, although the Study considers that they are critical for the savings elsewhere in the Study to be delivered.

6.3.8 Implementation plan

Changes to franchising, the role of devolved bodies, industry structure and incentives are discussed elsewhere in this report.

The ORR and the DfT (and where appropriate other franchising authorities) should issue a statement giving support for partnership working and state how they will treat the resulting cost and/or revenue benefits.

34 Office of Rail Regulation (2011) *Consultation on a Revised Contractual Regime at Stations – Proposed Changes to the Station Access Conditions and to the Independent Station Access Conditions*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/stations_contract_reform_mar11.pdf.

The ORR should review train operators and NR's licences and other contractual requirements to identify whether there is a potential to mandate closer working relationships.

The ORR should, within a year, undertake a review of industry change and consultation process, and propose amendments to contracts and the Network Code.

7. Area C – Structures, interfaces and incentives

This area is key to putting in place what GB rail currently lacks – an effective supply chain that starts with the customer (passenger and freight) and focuses its efforts on meeting the customer's needs in a cost-effective manner. Only if structures, interfaces and incentives are aligned can such a system operate.

7.1 Structures and interfaces

7.1.1 Description of studies and analysis

The Study commissioned two pieces of work to inform its analysis:

- Oxera and Arup (2010) Review of Cross-industry Interfaces, Incentives and Structures; and
- LEK and Frontier Economics (2011) *Alternative Railway Structures*.

The Oxera and Arup work involved:

- assessment of the rail industry's legal and structural framework;
- identification of the key barriers to improving value for money, through examining a number of case studies on industry interfaces and incentives, covering:
  - management of operational performance;
  - infrastructure possessions;
  - stations;
  - franchising system;
  - timetable planning;
  - rolling stock procurement;
  - long-term planning;
  - infrastructure renewals and enhancement; and
  - infrastructure capacity allocation;
- review of best-practice in cross-industry relationships and structures from the water, energy and aviation sectors; and
- assessment of the potential for improving value for money through removing interfaces and amending structures.

Oxera and Arup identified that the ways in which current industry structures and interfaces operate were a significant barrier to cross-industry efficiency. The Study therefore commissioned

further work on the impact of alternative structures and interfaces from consultants LEK and Frontier Economics. The LEK and Frontier Economics work involved:

- case study workshops for Chiltern and East Coast;
- two cross-industry workshops to discuss emerging findings;
- a review of academic literature on the impact of vertical and horizontal separation in rail elsewhere;
- an assessment of horizontal separation in GB utility sectors; and
- mini case studies into the impact of changes to industry structure including British Rail Organising for Quality, Melbourne, Germany, Latin America, Hong Kong MTR, Merseytravel, and US Class 1 railroads.

The Study also commissioned a detailed bottom-up engineering analysis of the impact of greater integration between rail infrastructure and train operations in the Chiltern area.

The LEK and Oxera work involved over 50 interviews with key stakeholders in the rail sector.

7.1.2 Evidence base

The Study's assessment is based on the following documents:

- Oxera and Arup (2010) *Review of Cross-industry Interfaces, Incentives and Structures*;
- LEK and Frontier Economics (2011) *Alternative Railway Structures*;
- First Economics (2010) *The Break-up of National Grid's Gas Distribution Business*; and
- LEK (2011) *Cost and Revenue Sharing*.

It has also been informed by a number of stakeholder interviews and cross-industry stakeholder meetings where the Study's findings and emerging thinking has been subject to constructive challenge.

7.1.3 Key data

The rail industry structure is complex with a single network infrastructure operator, Network Rail (NR), and 19 franchised train operators, three open access passenger operators and four principal freight operators.

NR has a dominant position in the industry. While there are advantages in its current position in terms of network-wide co-ordination, consistency and economies of scale, LEK found that "it did not have the external pressures required to ensure that it delivers for its funders and customers". There appear to be a number of potential reasons for this:

- NR's status as a Company Limited by Guarantee (CLG) status, with no equity and members instead of shareholders, the majority of which are drawn from the general public;
- the relatively fragmented customer base, by far the largest group of which, franchised operators, are protected from changes in NR's costs and are on relatively short franchises; and
- rail is one of the few utilities where there is still a single national operator, with a lack of direct comparators for many activities, as shown in Table 7.1. The Office of Rail Regulation (ORR) has therefore tended to rely on benchmarking against European operators as the basis for

comparative efficiency assessments. Comparative regulation has been shown to have significant benefits. For example, in 2005 National Grid sold four of the eight gas distribution networks to other companies. The Office of the Gas and Electricity Markets (Ofgem) estimated that this would provide incremental efficiency improvements of 1.13% per year over 15 years. The National Audit Office (NAO) found that this was likely to underestimate the customer benefits of the separation.[35]

Table 7.1: Ownership and competition in regulated utilities

	Number of regional entities in GB	Number of separate owners	Comparative regulation/benchmarking
Gas	8	4	Ofgem's price determination is based on efficiency benchmarking of Gas Distribution Networks with those companies lagging behind the efficient frontier having a more challenging cost-reduction target for the following period
Electricity distribution	14	7	Ofgem's price determination is based on efficiency benchmarking of Distribution Network Operators with those companies lagging behind the efficient frontier having a more challenging cost-reduction target for the following period
Water and sewerage	11	11	Ofwat's price determination is based on efficiency benchmarking of regional Water and Sewerage Companies with those companies lagging behind the efficient frontier having a more challenging cost-reduction target for the following period. Water only companies are also included in this benchmarking
Fixed telecoms	Multiple*	Multiple	Fixed telecoms have been deregulated since 1991 with extensive competition throughout the value chain
Post	1	1	Postcomm does extensive internal benchmarking for Royal Mail, the only regulated postal company. The deregulation of the post sector is allowing emerging competition

35 National Audit Office (2006) *The Office of the Gas and Electricity Markets: Sale of Gas Networks by National Grid*. This document can be accessed at www.nao.org.uk/publications/0506/sale_of_gas_networks_by_nation.aspx.

	Number of regional entities in GB	Number of separate owners	Comparative regulation/benchmarking
Air	14†	7	In 2009 the Office of Fair Trading (OFT) referred BAA, the dominant airport owner, to the Competition Commission (CC) arguing that the lack of competition may lead to higher charges. The CC concurred and BAA has since sold Gatwick
Road (motorways and trunk roads)	3	3	The Highways Agency is under pressure from the NAO to improve value for money using comparative benchmarking, for example by using cost differences between England and Scotland and Wales
Heavy rail	1	1	In the 2008 periodic review, the ORR set one national efficiency target and detailed internal benchmarking was only used for a proportion of spending

Notes: * Includes BT and other national fixed telecoms as well as a range of local networks; † GB airports served by NATS.

Source: LEK.

The fragmentation of the rail industry means that there are numerous cross-industry processes which require industry parties to work together. For example, train operators and NR have to work together to improve operational performance, as train delays are the result of a complex interaction between the performance of the rolling stock and infrastructure and the knock-on effect on-train services.

Industry fragmentation creates multiple interfaces and significant costs. While interface costs are substantial, possibly up to 5% of Train Operating Company (TOC) costs, much of this cost would be incurred under alternative arrangements. However, it is how interfaces work across the industry that is critical in determining efficiency and Oxera identified a number of areas where incentives were substantially misaligned.

7.1.4 Barriers to efficiency

Many stakeholders recognise that the way in which the current structure works is a barrier to efficiency. This barrier appears to contain a number of principal elements, as follows.

Fragmentation

Rail industry functions are divided amongst a significant number of different entities:

- NR, 19 franchised train operators, plus a number of freight operators, open access passenger operators, and numerous suppliers and contractors;

- numerous industry bodies (e.g. the Rail Safety and Standards Board (RSSB), the Association of Train Operating Companies (ATOC), the National Task Force (NTF), the Technology Strategy Leadership Group (TSLG) and others); and
- two principal regulators – the ORR, which primarily regulates NR, and the Department for Transport (DfT), which regulates franchised train operators and fares.

What is crucial in this respect, however, is not so much the number of entities as the fact that, at the interfaces where efficiency requires that different parties work closely together, this is not happening for many reasons, not least the structure of NR, ineffective or misaligned incentives, or the silo mentality of industry players.

Other industries involve significant numbers of players, but have generally been more successful than GB rail in finding ways to work together where this is necessary. Overcoming this barrier in GB rail is one of the principal issues for this Study, particularly in relation to co-operation at route level between NR and TOCs, co-operation at industry level on matters that must be taken forward together (e.g. innovation) and integration of regulation – which would be essential for closer working between NR and TOCs.

The structure of NR

For reasons that were perhaps understandable in the aftermath of Hatfield, NR has operated in a way that was relatively centralised. This, together with heavy emphasis on internal processes, has led to a situation where stakeholders have perceived NR to be bureaucratic, inflexible, sometimes arrogant and often expensive.

The fact that NR has been such a centralised, monolithic structure has meant that the ORR has not had internal domestic benchmarks, thus making it more difficult to get a good fix on NR's internal efficiency.

In addition, NR's status as a Company Limited by Guarantee (CLG), with members rather than shareholders, makes governance and accountability a further challenge.

The nature of TOCs

The TOCs are commercial companies with normal responsibilities to their shareholders. Their behaviours are also conditioned by the fact that franchises have often been for a maximum of seven years and, inevitably, the operators are very conscious of how many years are left on those franchises.

As a result of all these factors, TOCs understandably, and not infrequently, take positions that seek to exploit contractual positions to the maximum, or which reflect a very short-term view, when the real interests of the railway would be better served by a longer-term view or a more co-operative approach.

Unbalanced relationships

There is a lack of balance:

- between a large, centralised NR and numerous much smaller train operators; and
- between central Government which, because of its detailed involvement in so many aspects of the rail industry, is a major determinant of industry costs and the industry itself, which is

relatively fragmented and is, for these reasons, able to absolve itself from responsibility from many of its costs.

All of the above factors, together with ineffective or misaligned incentives, lead to a lack of focus on industry costs and value for money, and to relationships that are often unproductive.

7.1.5 Principal issues

The study considers that the following principal issues need to be addressed:

- How to strengthen co-operation/coherence and the focus on reducing costs:
  - between train operators and NR so that there is a better balance and interface between different parties, better alignment and incentives across interfaces, and that infrastructure expenditure is more closely aligned to the needs of customers and the market, and that there are stronger incentives for joint working and partnerships (this is discussed in more detail in Section 7.2);
  - at an industry level – between industry players and industry bodies, and between Government and industry – so that there is greater clarity over the roles, and so that the industry can accept greater responsibility for costs. The Study considers that this can start to be addressed by a Rail Delivery Group that would enable the industry to address those issues which need to be addressed at that level, and allow the Government to step back; and
  - in regulation so that there is a single regulator for system-wide impacts – this is considered in the section on regulation (Section 26).
- How to develop NR's structure to:
  - improve NR efficiency – separate devolved NR business units or companies would increase responsiveness at a local level, as infrastructure businesses would be better aligned to train operators and so be in a better position to deliver improvements to passengers and freight users. NR is a single national monopoly and so the ORR has, in the main, had to rely on international comparisons to benchmark efficiency. As NR's efficiency improves and the gap to international comparators (which are mainly state-owned national monopolies) reduces, international benchmarking may become less effective in driving efficiency improvements. GB-based comparative regulation has been shown to deliver significant benefits across a range of sectors, particularly where independent ownership has been involved; and
  - improve accountability, so that NR is more accountable to its customers and funders, by clarifying the role of NR's members and making the role of non-executive directors more transparent – this is considered in the next section on incentives (Section 7.2).
- How to make the changes as quickly as possible, in a well-managed way so that changes are evolutionary and carefully phased, and take into account emerging information.

In view of the importance of structural issues, this section now considers a number of aspects and options in detail.

Guiding principles

The Study considers that the interfaces between the main players need to work more effectively and the structures need to be better aligned. The Study has used the following guiding principles in developing its recommendations:

- Success in reducing costs depends above all on how well the various rail organisations and their people work together, in particular NR and the train operators. The industry and its suppliers also need to have more effective partnerships.
- There should be better alignment of organisations and of their objectives and incentives, particularly as between NR and the TOCs;
- There should be greater devolution/decentralisation, particularly in NR, but on a basis that is compatible with running an effective single rail system.
- There must be proper protection for freight and other operators.
- There must be recognition that "one size does not fit all".
- A "big bang" approach should be avoided, i.e. avoid immediate total change in all structures.

These principles should allow a move towards a set of long-term relationships that are more effective.

Devolution/decentralisation within NR

The Study considers that **devolution** within NR to route-level units is an essential first step. The establishment of route-level units, sometimes referred to as "horizontal separation", could also foster greater efficiency by enabling better alignment with train operators – allowing the devolved Route Infrastructure Managers (Route IMs) to be closer to their customers and passengers and freight users. Devolution would also allow local management to take more of their own decisions, responding to local conditions and creating innovation to reduce costs and improve services.

Devolution within NR could also allow comparative regulation of Route IMs by giving the ORR the ability to compare performance across the different devolved businesses.

Greater devolution within NR could improve relationships with train operators as the size of Route IMs would be similar to many TOCs, and Route IMs would, to a significant extent, have control over their costs, enabling them to better respond to the needs of train operators. Devolution is therefore likely to make incentives more effective as these will be aligned at a more local level.

The Study acknowledges that NR's devolution proposals[36] (where operations, maintenance and some responsibility for renewals and enhancements are devolved to route managing directors) and the publication of regional accounts[37] are an important first step. However, to be truly effective it is important that devolution is driven far enough so that the routes have significant management independence. This will allow Route IMs to pursue their own policies, allowing meaningful comparisons between routes, so that they can be regulated separately on a comparable basis.

The Study considers that, for devolution and comparative regulation to be fully effective, NR should devolve further areas of responsibility to route managing directors. In particular, Route IMs should be responsible for asset management strategy, managed stations, the delivery of all renewals, and the specification and development of the majority of enhancements. Table 7.2 provides a high-level indication of the split based on the Study's discussions with the industry and the work carried out by consultants. The Study considers that NR should refine the allocation of responsibilities working in conjunction with train operators, the ORR and Government.

36 www.networkrailmediacentre.co.uk/Press-Releases/NETWORK-RAIL-MOVES-TO-CREATE-DEVOLVED-BUSINESS-UNITS-16b3/SearchCategoryID-2.aspx.

37 See Regulatory Accounting Guidelines, www.rail-reg.gov.uk/upload/pdf/regulatory-accounting-guidelines-2011.pdf.

To be effective, the Study considers that devolution needs to go far beyond simple accounting separation of individual areas. It is important that the route managing director has direct control over the majority of his/her costs and that costs from other areas and central functions are properly exposed as transfer payments. Furthermore, in order to obtain the full benefits of comparative regulation, the Study considers that Route IMs should be regulated as independent businesses with separate price controls, efficiency trajectories and, where appropriate, Regulatory Asset Bases (RABs).

Notwithstanding devolution of greater responsibility to Route IMs, the Study considers that **a national IM will be essential** to facilitate seamless operation of the network as a whole, ensure best use of network capacity, and to provide:

- system-wide infrastructure co-ordination and assurance; and
- central support functions – which would support rather than lead the work of the Route IMs. This central organisation should fulfil a very different role to that of the past.

The system-wide infrastructure co-ordination and assurance functions could include:

- acting as a "shallow" or high-level national operator, responsible for the national timetable and capacity allocation, access charging, national operations standards and system co-ordination (including possessions co-ordination);
- providing assurance during the transition to the devolved structure;
- the co-ordination of asset management strategies of routes;
- acting as a single point of contact for freight and other national traffic;
- providing national infrastructure IT systems, such as billing systems and punctuality monitoring; and
- providing infrastructure strategic planning.

NR central support functions could include:

- undertaking a high-level procurement role where appropriate;
- providing central infrastructure services to Route IMs where economies of scale so dictate (or where third party suppliers do not exist);
- providing central system "network services" such as backroom and communication services;
- retaining freehold ownership of the national infrastructure rail assets as deemed appropriate by Government; and
- potentially, in competition with third parties, providing a major projects management role for Route IMs or the Government.

All other functions would be devolved to the Route IM.

Table 7.2: Potential split of functions between central and regional bodies

National		Devolved activities
System-wide co-ordination and assurance	**Central support services**	
Standards for inter-operability (with RSSB, not duplicative) Signalling priority rules Strategic planning, including leadership of Route Utilisation Strategy (RUS) programme Asset management strategy co-ordination Capacity allocation Timetabling co-ordination High-level IT systems and information services "Single desk" for network-wide operators Access charging collection and allocation	Scarce resources including heavy plant Group procurement Corporate support Logistics Assurance Major projects/ enhancements	Signalling Route planning Mobile Operations Managers (MOMs) Possession planning Control functions Performance management Scheme development Data collection Safety Customer services Delivery of maintenance Delivery of small/medium enhancements* User specification for large projects Scheme development Asset management strategy and plans Managed stations Delivery of renewals (Property) (Telecoms) (Power management)

Notes:

* It is unclear whether NR's devolution proposals include the delivery of medium as well as small enhancements.

Shaded areas are additional to NR's current devolution proposals.

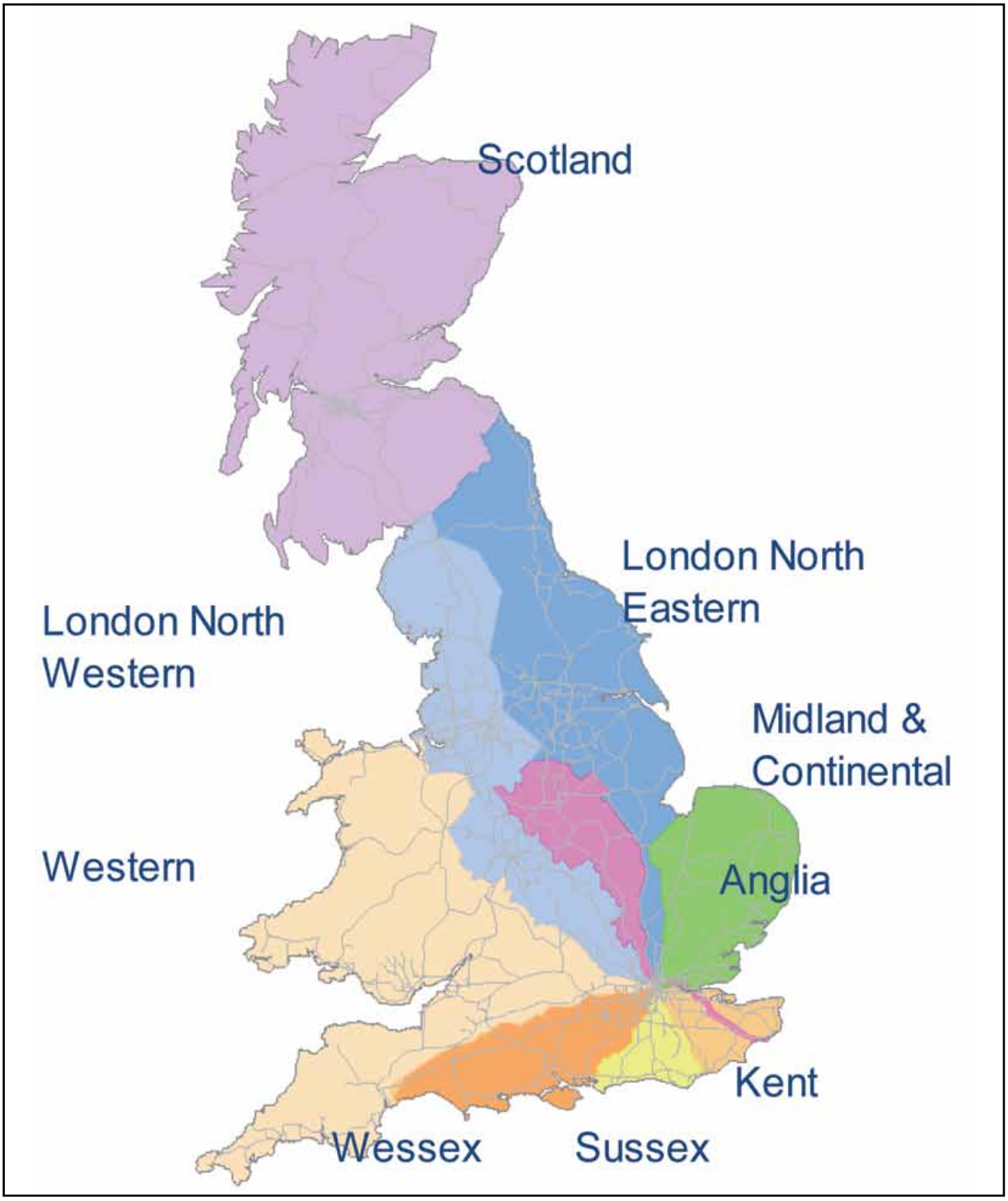
Areas in brackets are additional responsibilities for discussion.

Source: Adapted from LEK.

The **geographical basis for devolution** based on NR's current proposals (as set out in the regulatory accounting guidelines for 2011) is NR's nine operating routes (as they existed in early 2011, and as shown in Figure 7.1), with further devolution of responsibility in the Merseyside and Wales areas. Based on the work undertaken by LEK, the Study considers that there is a case for splitting a Northern route out of the London North Western (LNW) and London North Eastern (LNE) routes to better align infrastructure to train operating companies and markets. The InterCity West Coast and East Coast Main Line routes would remain in the LNW and LNE routes, respectively.

This would give a total of 12 Route IMs, most of which would be comparable in size to many European railways (e.g. the Netherlands, Denmark and Switzerland). Econometric benchmarking analysis undertaken by the ORR suggests that economies of scale in infrastructure management are exhausted well below NR's current size. Further work will be required to validate the scope of devolution and to refine the proposed routes, although it is important that a management and financial track record is established for the Route IMs as soon as possible to allow effective comparative regulation to be undertaken for the next Control Period.

Figure 7.1: NR operating routes



Source: NR.

While there are many benefits of greater devolution and comparative regulation, there are **risks and constraints** which the Study has sought to address, including:

- potential loss of economies of scale, which the Study considers can be addressed by keeping the Route IMs relatively large and keeping activities where there may be significant economies of scale (such as procurement) within national central support functions;
- potential reduction in asset information, which the Study considers can be addressed by strong regulatory guidelines and by using NR's established systems and protocols;
- difficulty of delivering major enhancements which span different Route IMs, which the Study considers can be addressed through the central delivery of major enhancements; and
- difficulty of dealing with multiple Route IMs for cross-network operators, which can be addressed by having a single point of contact for national operators and the protections for secondary operators listed below.

Independent ownership of some route infrastructure concessions

The Study considers that there is a strong case for having some independent ownership of Route IM concessions. Independent ownership would increase the effectiveness of comparative regulation by allowing Route IMs to be truly independent, with a sharper profit motive increasing the incentive to improve efficiency and new management giving the potential to accelerate innovation. It could also improve the interface with TOCs as, being independent, the infrastructure manage could be able to respond to local needs more effectively.

Independent ownership could be achieved through the letting of a long-term concession for the work undertaken by the Route IM. To be truly independent it is important that the asset owner, NR, should have little direct interest in the concession, with the management of the asset subject to independent regulation through a licence. The separation of asset ownership and management is discussed in further detail in Section 22.

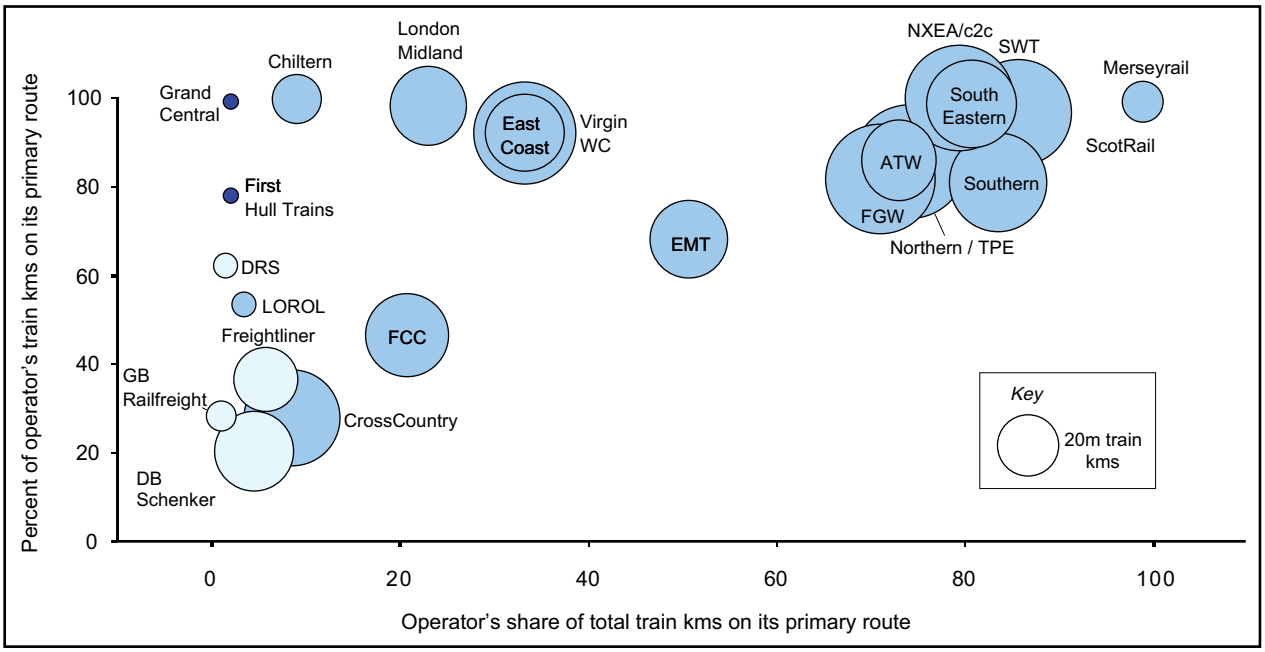
LEK estimated (based on Ofgem's analysis of the sale of gas distribution networks) that one separately-owned Route IM could provide efficiency improvements with a present value of £5.5bn over 30 years. This would be equivalent to savings of over £300m per year after 10 years. Three separately owned Route IMs would provide improvements with a present value of £11.2bn over 30 years. This would be equivalent to savings of around £600m per year after 10 years. Clearly it is impossible to be precise about the potential benefits, but the Study considers that independent ownership could lead to substantial benefits.

There are also likely to be additional benefits from the introduction of risk capital/equity into any of the independent IMs (see Section 24 for a discussion of risk capital). There will also be additional costs, due to the costs of separation and sale/concession of assets through to a reduction in the ability to spread risk across different parts of the network. LEK estimate that these costs would be a scale factor lower than the benefits, at around £0.7bn over 30 years (assuming three independent owned Route IMs).

It is recognised that independent ownership of Route IMs could create additional interface issues. It is therefore important that independent ownership is considered only in reasonably self-contained parts of the network, i.e. parts of the network which tend to be used by a single dominant operator. As indicated in Figure 7.2, eight of the twelve Route IMs identified previously might have the potential for independent ownership, although further work would be required to verify that these could be viable standalone businesses. The Study does not advocate introduction

of independent ownership to such an extent, but considers that it should be the aim to have one Route IM in independent ownership by 2014/15 and that further independent ownership should be considered on a case-by-case basis after assessment of the results from the initial pilot.

Figure 7.2: Mapping of train operator versus primary operating route



Alignment between Route IMs and train operations

Oxera estimate that, while the costs of interfaces between train operators and NR are substantial (perhaps 5% of TOC costs), much of these costs would continue to exist even if the interfaces were removed (e.g. the need to allocate causes of delay would continue although disputes would reduce). What is of much greater significance is that the current structure, approach and incentives have prevented a whole-system approach being taken with respect to costs and benefits, and have clearly inhibited innovation and change.

As described above, the creation of Route IMs (even within NR) will create much better alignment between infrastructure and train operations. However, this, on its own, will not create the whole-system approach required to reduce costs. The following sections describe three ways to improve interfaces and to better align incentives for infrastructure and train operations, namely:

- cost and revenue sharing and joint targets between NR and train operators;
- joint ventures or alliances between NR and train operators; and
- vertical integration through letting a joint concession for train operations and infrastructure management.

The Study recommends the establishment of **cost and revenue sharing** mechanisms as the minimum level of alignment across the network. These mechanisms would allow train operators and NR to share each others' outperformance of cost and revenue trajectories. This would provide greater incentives across the wheel-rail interface, help train operators and the IM to take a whole-system view, and ensure that the railway better reflects the needs of customers and taxpayers. The Study considers that it is essential that any cost and revenue sharing mechanisms are contractual and offer direct explicit financial incentives to the industry to reduce costs. The ORR, NR and ATOC

have been undertaking work in this area, and further work will be required to identify the precise mechanisms to be used.

Cost and revenue sharing mechanisms could be supported by other mechanisms to build co-operation, such as:

- combined train operating company and infrastructure profit and loss accounts – these could be TOC based so that they are better aligned to passenger markets. By making rail industry costs and subsidies more transparent, it would be easier for passengers and Government to identify what fares and subsidy are paying for, and where there is a need to reduce costs or increase revenues to improve cost recovery. Consistent route-level whole-system profit and loss accounts would support Route IMs in identifying their customer needs; and
- joint route development and management groups including train operators and Route IMs, which could identify the current and future requirements of individual parts of infrastructure.

There are also opportunities for intermediate approaches such as **joint ventures or alliances** between NR and train operators. These could take many forms and could include signalling operations, performance management and maintenance, renewal and enhancement of the network. Joint ventures would have the advantage of being a less radical change than full vertical integration and it may well be possible to introduce them before the end of current franchises. Joint ventures could also be appropriate in a greater number of areas and would not necessarily require a move away from a 15-year franchise length. What is essential, however, is that joint ventures and alliances are meaningful, substantive structures that can deliver the significant cost savings required.

The Study considers that there is a case for **piloting vertical integration** as soon as is practical. Vertical integration appears to be the structure which could best align incentives between train operators and the infrastructure manager. Decision-making would be based on the actual needs of the market rather than contractual proxies (such as the variable usage charge which reflects track damage costs). The specification and prioritisation of infrastructure work would better reflect customers' needs and rolling stock decisions could take better account of the impact on infrastructure. That said, vertical integration would represent a greater change to current arrangements and it is accordingly discussed in more detail.

The Study understands that Merseytravel is taking forward proposals to take over infrastructure assets from NR. In some ways vertical integration in this area could be ideal given the lack of other operators in the area. However, the small size of Merseyrail may limit the exploitation of economies of scale, and the structure envisaged (as understood by the Study) falls short of full integration.

The Study considers that, in addition to the current proposals on Merseyrail, vertical integration could eventually be considered in seven possible areas which are largely self-contained and where there is a dominant train operator: Anglia (which could be enhanced through a merger with the Essex Thameside (C2C) franchise), Sussex, Kent, South Eastern, Wales, Western and Scotland (while noting the latter is not DfT's decision). LEK estimate that vertical integration in all of these areas could provide net incremental benefits (in addition to those identified for horizontal separation) of some £0.1bn to £0.5bn over 30 years for one vertical integration, and £0.7bn to £4.4bn over 30 years for seven such integrations. It should be emphasised that these are high-level indicative benchmarks over a long period of time. The Study's recommendations do not extend beyond a single vertical integration pilot at this stage.

While the structure of any vertically-integrated concession needs to be developed further, Table 7.3 shows an illustrative structure of a vertically-integrated business. This could be based on letting a 15–30-year concession for train operations and infrastructure, which would then be regulated largely by the ORR.

While there are undoubted advantages of vertical integration, there are also some potential risks, including the following:

- There could be a risk that a vertically-integrated operator would discriminate against other train operators. This could be addressed by the protections for other operators set out later in this section of the report.
- A potential loss of focus from combining two different businesses together. It would clearly be a task for the management of the vertically-integrated business to make sure that this would not be an issue.
- Potential reduction in value for money as the vertically-integrated concession would potentially be longer than standard franchises for train operations, reducing the frequency of competition for the award of the tender. This could be overcome through the improvements to the franchising process suggested in Section 5.

In addition to these risks, an infrastructure concession, whether it is standalone or part of a vertically-integrated unit, would need to address issues around asset information and network capability. Potential bidders for a concession would need assurance about the quality of the assets that they are taking over. Although NR's asset information has improved over recent years, further improvements will be required to reduce this risk. In addition, while network capability and quality will be monitored and enforced by the ORR, there may be a need for additional mechanisms at the end of a concession (such as financial penalties) to ensure that standards are maintained.

Given that there is much development required to introduce vertical integration, the Study advocates a phased introduction, starting with a pilot in one area (in addition to Merseyrail) so that experience from that area can be used to inform the structure and decisions around vertical integration elsewhere. Given timings of future franchise competitions, the Study considers that the first opportunity for a vertical integration trial is in the Greater Anglia region starting in 2014. The Study recognises that to achieve this pilot by 2014 is ambitious, but this could be achievable if all parties begin preparation now.

Table 7.3: Illustrative structure of a vertically-integrated business

Building block	Comment
Specification	There is no need to change the High Level Output Specification (HLOS) process. Franchise specification can be as described in Section 5.3
Asset ownership	Asset ownership can remain with NR, with the ORR having responsibility for overseeing asset sustainability and NR being restricted to a largely passive role in its capacity as asset owner
Concession length	Concession length is likely to be in the range of 15 to 30 years and will be determined primarily by EU public service contract requirements
Company structure	Infrastructure management and train operations functions are likely to need to remain distinct within an overall holding company structure to facilitate comparative benchmarking and regulation. Each part of the business could be licensed separately
Regulatory role	The ORR could retain the primary relationship with the infrastructure management component of the concession to facilitate comparative benchmarking. There could be a need to transfer some regulatory functions from the DfT to the ORR (see the section on the role of regulation (Section 26))
Charge setting/ change management	The ORR could continue to undertake the periodic review process for the infrastructure management component of the concession. It may be beneficial to extend the periodic review process to train operations for very long concessions and/or give the ORR a role in regulating fares (subject to DfT policy guidance)
Access charging/ capacity allocation	EU requirements for the separation of train operations from access charging and capacity allocation could be met by transferring responsibility of these functions to the central IM as described in Table 7.2
Concession letting process	Concessions could be awarded through a competitive bidding process, although the evaluation process would necessarily be significantly more complex than the DfT's current approach
Contracts	There may need to be an access contract between the train operations and infrastructure management parts of the concession. Other train operators using the network would also need access contracts with the infrastructure management part of the concession. The concession would need a contract with the National IM for access charging, capacity allocation and other functions

Source: Study team and LEK.

How, and how fast, all of the above possible re-structuring moves forward is for the industry, Government and the ORR to determine, but it is the view of the Study that, as quickly as is practical, there needs to be introduction of cost and revenue sharing, a pilot vertical integration and initiation of several joint ventures or alliances.

Protection for other operators

Any separation of central and Route IM functions and potentially closer alignment between train operators and Route IMs, particularly if it involved vertical integration, would need to be complemented by protections to ensure that there is no anti-competitive behaviour, and that freight, open access and cross-boundary traffic are treated fairly. Potential protections come in three main forms:

- Central IM functions carried out by a national body separate to the Route IMs – there is a need to ensure that a national and system-wide approach to network capability, access charging, timetabling and capacity allocation, and other critical issues such as possessions co-ordination, are carried out independently of any aligned or integrated Route IMs and train operators. The central IM would also have a single desk for freight and national passenger operators, ensuring that operators do not have to deal with multiple Route IMs, and would be responsible for managing the operational performance of these services on a national basis. The specific needs of freight operators are set out in more detail in section 13.8 this report, and these will require to be met.
- Legal process safeguards – while there are protections for third parties in the current access regime and requirements of European directives, this may need to be enhanced to ensure that anti-competitive behaviour does not take place. This could potentially include: enhanced licence conditions on non-discrimination, fast-track disputes resolution, enhanced KPI monitoring, a national approach to aspects of network capability such as axle weights and loading gauge, and a clear definition of network capability and capacity that should be protected for freight and other users.
- Incentives – this could include management incentives and/or regulatory targets on the level of freight and other operators' use of the network.

7.1.6 Recommendations for cost reduction

The Study sees the structural options analysed earlier as offering considerable potential to facilitate cost savings. The DfT and ORR, in consultation with industry, should ensure:

- that NR moves towards a fully-devolved and decentralised structure, based on 12 route-based units, as quickly as practicable and certainly in time to be the basis for CP5 regulation;
- that NR aims to put in place one independently-operated Route IM concession by 2014/15;
- that much closer alignment between NR and TOCs is secured through:
  - cost and revenue sharing as a minimum for all franchises and routes as quickly as is practicable;
  - joint ventures or alliances, with the aim of having at least two of these in place by 2013/14; and
  - vertical integration, with at least one vertically-integrated pilot in place for the beginning of CP5 in 2014/15;

- that existing regulatory protections for freight and other users of the network are retained and, where necessary, strengthened to reflect the new interfaces emerging as a result of industry restructuring.

The Study does not believe that there is a system-wide presumption in favour of any one of these levels of alignment and that it is more a matter of "horses for courses". Within existing franchises it will be for NR and the relevant TOC(s) to determine the choice of approach, with the DfT and the ORR deciding for future franchises which approach and proposals offer the best value for money. The DfT and the ORR should proactively drive this process of closer alignment and should ensure that meaningful cost and revenue sharing is present as a minimum in all new franchises. The motivation for operators to develop, or participate in, these new forms of alignment will be to share in the efficiency gains that closer joint working can make possible, and to establish a track record of success in this approach.

The Study also recognises that none of the new structural options (vertical integration, joint ventures or alliances or horizontal separation) will proceed unless they are demonstrably the best value for money for relevant franchises or routes at the time. The Study does, however, expect that these options are likely to have significant advantages compared with the status quo.

7.1.7 Potential for, and timings of, cost savings

Based on the analysis undertaken by LEK, the Study estimates net incremental cost savings of £100m–300m per year by 2018/19 from:

- independent ownership of one Route IM;
- a trial of vertical integration; and/or
- cost and revenue sharing and joint ventures or alliances in other areas of the network.

These benefits would increase significantly, possibly by a factor of three, by 2023/24.

7.1.8 Implementation plan

While the implementation plan will undoubtedly evolve as further work is undertaken on potential structural changes, the key implementation milestones shown in Table 7.4 are proposed.

Table 7.4: Potential implementation plan

Date	Action
2011/12	NR's first year with audited accounts for Route IMs
2011/12	NR devolves responsibility to Route IMs for the first set of regions
2011/12+	The ORR develops framework for cost and revenue sharing, and introduces elements of the framework into new franchises
2011/12+	NR and train operators investigate benefits of joint ventures/alliances
2011/12+	Develop framework for vertical integration in Anglia region
2014/15	Independent Route IM concession
2014/15	Vertically-integrated concession on Anglia commences
2014/15+	Regulation of regional infrastructure managers by the ORR. Review settlement assumes full benefits of comparative regulation materialise
2015/16+	Decision on whether to introduce vertical integration or Route IM concessions on other areas based on experience

7.2 Incentives

7.2.1 Description of studies and analysis

This section describes how value for money could be improved through improvements in incentives.

The Study took forward a number of activities to investigate the potential for cost reduction and improved value for money that exist within the industry's complex structural and contractual arrangements. These included:

- identification of the key barriers to improving value for money, through examining a number of case studies on industry interfaces and incentives covering:
  - management of operational performance;
  - infrastructure possessions;
  - stations;
  - franchising system;
  - timetable planning;
  - rolling stock procurement;
  - long-term planning;
  - infrastructure renewals and enhancement; and
  - infrastructure capacity allocation;

- review of best practice in cross-industry relationships and incentives from the water, energy and aviation sectors; and
- assessment of the potential for improving value for money through improving incentives or removing interfaces.

7.2.2 Evidence base

The Study's assessment is based on the work that the Study has commissioned, in particular:

- Oxera (2010) *Review of Cross-industry Interfaces, Incentives and Structures*;
- LEK (2011) *Alternative Railway Structures*; and
- Buchanan and PricewaterhouseCoopers (2011) *Franchising Unit costs*.

The Study has also reviewed existing material, including:

- the review of industry incentives that was undertaken by the ORR as part of the last periodic review, PR08 – this draws on *Enhancing Incentives for Continuous Improvements in Performance*,[38] and supporting consultants reports;
- CEPA (2010) High Level Review of Track Access Charges and Options for CP5;[39]
- Nichols (2010) Comparison of Railway Enhancement Costs in Great Britain and Barriers Preventing Delivery of Station Projects by Train Operators;[40]
- Ofgem (2010) RIIO: A New Way to Regulate Energy Networks;[41]
- Martin Cave (CERRE) and Janet Wright (Indepen Consulting) (2010) Options for Increasing Competition in the Great Britain Rail Market: On-rail Competition on the Passenger Rail Market and Contestability in Rail Infrastructure Investment;[42]
- ORR (2009) Policy Framework for Investments – Obstacles to Investment Conclusions;[43]
- Europe Economics (2010) Future Price Limits – Risks and Incentives: Options Appraisal;[44]
- KPMG (2008) NR: Membership Aspects of Governance;[45] and
- LEK (2011) Cost and Revenue Sharing.

38 Office of Rail Regulation (2006) *Periodic Review 2008: Enhancing Incentives for Continuous Improvements in Performance*. London: ORR. This document can be accessed at http://www.railreg.gov.uk/upload/pdf/298.pdf.
39 CEPA (2010) *High Level Review of Track Access Charges and Options for CP5*. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/charges_review_cepa_report_june2010.pdf.
40 Nichols (2010) *Comparison of Railway Enhancement Costs in Great Britain and Barriers Preventing Delivery of Station Projects by Train Operators*. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/nichols-enhancement-costs-240610.pdf.
41 Office of Gas and Electricity Markets (2010) *RIIO: A New Way to Regulate Energy Networks*. This document can be accessed at www.ofgem.gov.uk/networks/rpix20/consultdocs/Documents1/Decision%20doc.pdf.
42 Cave, M. and Wright, J. (2010) *Options for Increasing Competition in the Great Britain Rail Market: On-rail Competition on the Passenger Rail Market and Contestability in Rail Infrastructure Investment*. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/increasing-competition-report-290510.pdf.
43 Office of Rail Regulation (2009) *Policy Framework for Investments – Obstacles to Investment Conclusions*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/investment_obstacles_conclusions_310309.pdf.
44 Europe Economics (2010) *Future Price Limits – Risks and Incentives: Options Appraisal*. This document can be accessed at www.ofwat.gov.uk/publications/commissioned/rpt_com_1010fplrisk.pdf.
45 KPMG (2008) *NR: Membership Aspects of Governance*. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/kpmg_membership.pdf.

In addition, the Study has benefited from numerous one-to-one meetings and cross-industry stakeholder meetings where key issues and emerging findings have been discussed.

7.2.3 Background and key data

Incentives can act in a variety of ways, for example:

- defined outputs in enforceable contracts, such as those in franchised specifications or licence obligations, for example NR's requirement to achieve a percentage of passenger trains arriving on time (as measured by the public performance measure (PPM)) to be at least 93% for London & South East services, at least 92% for other services;
- financial incentives which can act at the corporate level, for example the incentives faced by train operators through the pressure of shareholders; managerial – through management incentive plans; or contractual – for example the Schedules 4 and 8 financial compensation regimes for infrastructure possessions and operational performance in track access agreements; and
- non-financial incentives which can be related to reputation, for example through monitoring and publication of company performance and/or benchmarking, or the creation of a winning mentality.

It is clear that incentives within the rail industry are not acting optimally. Oxera identified four key areas where cross-industry incentives were misaligned:

- Franchising system – which sometimes does not encourage a focus on customers, or co-operation with NR to improve whole-industry outputs or industry whole-life costs.
- NR – which has limited incentives in certain areas:
  - its corporate governance structure means there is limited pressure to respond to financial incentives, with implications for the effectiveness of economic regulation in reducing cost;
  - it has limited incentives to balance local needs (e.g. in relation to asset management) against centrally determined standards;
  - it has limited volume incentives as variable usage charges are below current costs (as they are based on long-term efficient costs) and stakeholders have questioned the effectiveness of the volume incentive;
  - it has limited incentives to search out timetable enhancements (such as journey time reductions as well as frequency improvements) as, beyond the volume incentive, NR does not benefit from additional patronage or freight volumes; and
  - it has limited incentives to trade-off capacity utilisation against performance (the incentives around performance are much stronger than those around improving frequency, or journey time reductions).
- Investment co-ordination across the industry – enhancements and cross-industry projects are often hampered by incentive misalignments:
  - it is not clear that best value is being obtained from HLOS projects due to the split allocation of responsibilities across parties and the difficulty of implementing changes through franchise agreements;

  - TOCs have limited incentive to input into projects to ensure that they are least-cost, highest-benefit;
  - cross-industry engagement in cross-industry projects often occurs too late in the process;
  - in the case of new rolling stock, there seems to be limited incentive to achieve the right balance between operator and NR design preferences; and
  - NR can find itself at the mercy of industry and statutory consultees, leading to project delays and added cost.
- Stations – where the complexity of the contractual matrix in which stations operate can lead to: sub-optimal investment by NR (given incentives around dilapidation expenditure), sub-optimal asset management decisions (since improvements may not be taken forward, and life-expired assets are maintained to avoid removal procedures) and poor asset knowledge. Split responsibilities for station development (design, development, regulation and funding) can lead to delays, avoidable cost increases, and potentially missed opportunities.

7.2.4 Barriers to efficiency

The evidence indicates that a key driver of high whole-industry costs is the lack of a joined-up focus on costs and revenues, with little direct link between revenues that accrue to train operators and the infrastructure costs incurred elsewhere in the industry. Few incentives exist for train operators and NR to work together to reduce whole-industry costs, with infrastructure costs in particular seen by many as unresponsive to the needs of users.

Key barriers to improved cost efficiency include the following:

- Misaligned incentives between NR and TOCs, with neither set of incentives focusing either group on cost reduction.
- Perversely, existing franchise agreements transfer risk to franchising authorities (the DfT, Transport Scotland, Transport for London (TfL), the Welsh Assembly Government and Merseytravel), specifically:
  - TOCs are held neutral to changes in track access charges;
  - outputs from TOCs are tightly contractualised and so limit the potential response to market changes; and
  - revenues are subject to cap and collar arrangements, which pass revenue risk back on to funders.
- NR is generally subject to weak financial incentives and it benefits from a Government guarantee of its debt through the financial indemnity mechanism. This results in only limited incentives to outperform regulatory targets and to minimise costs.
- There are incentives towards capital expenditure and there are limited incentives to value engineer capital schemes so that they deliver the required outputs at the lowest cost.
- Government involvement can be inappropriate by inhibiting train operators from responding to the market, and leading to decisions that overly reflect Government rather than market requirements.
- A lack of customer-driven relationships and partnerships through the supply chain, with supplier management tending to be driven by contractual imperatives.

- There is a marked level of mistrust between parties (TOCs, Government and suppliers, including NR) and overly-centralised decision-making within key organisations such as NR.

7.2.5 Principal issues

The following opportunities could be developed and exploited to support cost efficiency gains and driving better value:

- giving train operators greater commercial freedom as they are closest to the market – this would allow the railway to focus better on end-user and Government priorities;
- comparing and benchmarking companies would improve incentives for cost efficiency;
- creating separate business units or companies would allow a variety of market-based approaches to be taken which could encourage innovation and drive out costs;
- strengthening incentives on NR to improve financial discipline, customer focus and better efficiency;
- improving NR governance could increase the ability to hold directors to account and improve incentives towards efficiency;
- making better use of capacity could reduce the reliance on capital solutions;
- making the infrastructure manager more aligned and responsive to train operators would encourage infrastructure expenditure to meet local requirements and the needs of customers, particularly if train operators and customers have a financial interest in the outcome;
- strengthening joint working and aligning incentives between train operators and the infrastructure manager would improve cross-industry working; and
- increasing the contestability of enhancement expenditure, particularly in the early stages of scheme development, could significantly improve value for money of improvements.

7.2.6 Recommendations for cost reduction

It is essential that organisations such as NR and the TOCs are incentivised to reduce costs, to drive value, and to push for improvement and change, without taking excessive risk.

Incentives, by their nature, cut across many areas of the Study. They impact on the way that the industry deals with innovation and safety; they are impacted by the way outputs are defined, and the way that parties interact with each other. Consequently, this section of the report brings together a number of changes identified elsewhere in the Study that might impact on incentives as well as identifying other ways in which incentives might be improved.

Strengthening incentives on NR

The structures section has described the beneficial impact of devolution of responsibility to Route IMs and the consequential advantages in terms of comparative regulation, in particular if some of those Route IMs were independently owned. The Study considers that independent ownership of some Route IM concessions would provide a significant benefit to efficiency from the ability to compare performance across a number of different companies and the ability of local management to make local decisions, responding to local conditions and creating innovation. In the case of vertical integration there would be strong alignment between train operations and infrastructure.

NR's corporate financial incentives could, at some point in the future, be improved by the introduction of private investment, which should provide a hard budget constraint and greater external scrutiny of its performance. As holders of equity or debt are likely to require a clear track record and structure, the Study considers that introduction of equity or unsupported debt could be considered only when the restructuring of NR is further advanced, when the financial track record of the restructured entity is apparent, and when the necessary asset information systems are in place. This is discussed in more detail in the private investment part of this report (Section 24). Additionally, independent ownership of some Route IM concessions could improve further corporate financial incentives by the introduction of equity and shareholders and the consequential impact on comparative benchmarking.

NR's corporate governance has often been cited as a barrier to improved efficiency through the limited ability to hold company directors to account. NR has around 120 public and industry members instead of shareholders. The ORR reviewed the membership aspects of NR governance in 2008[46] and found:

- a lack of clarity about the role of members and the way members are selected;
- concerns around the role of industry members and the overall number of members; and
- issues around members having access to sufficient independent information and analysis in order to take an informed view of NR's performance, including future prospects, so that they can hold NR to account efficiently.

The UK Corporate Governance Code[47] states that it is the role of non-executive directors to hold management to account. NR has recently appointed a number of additional high-quality non-executive directors and this is to be welcomed. The Study considers that increasing the transparency of the role that non-executives play could help to reassure stakeholders that NR's management is being properly held to account.

Achieving an effective relationship between the Members and the NR Board is more difficult, as the arrangement is so unusual. However, as with normal shareholders, the quality of engagement with the Board is the key to effectiveness and, in that respect, the Members structure appears to have room for improvement. The Study considers that NR should consider the following changes to improve governance:

- giving members a mission statement so that they are clear on the role that they are performing;
- reviewing the status of industry members and whether the overall number of members could be reduced, which could allow members to be more effective;
- considering alternative ways in which the views of industry could be provided to members;
- increasing the independence of the selection process of members so that it is clear that the members are independent;
- providing independent information and analytical support to members so that they can make better informed assessments/decisions; and
- increasing the transparency of the role of the non-executive directors by, for example:

46 KPMG (2009) *Network Rail: Membership Aspects of Governance*. This document can be accessed at www.rail-reg.gov.uk/upload/paf/kpmg_membership.pdf.

47 Financial Reporting Council (2010) The UK Corporate Governance Code. This document can be accessed at www.frc.org.uk/documents/pagemanager/Corporate_Governance/UK%20Corp%20Gov%20Code%20June%202010.pdf.

- publishing the minutes of board meetings; and
- requiring non-executive directors to meet separately once a quarter and publishing minutes of the meetings.

NR's incentives could also be assisted by improvements in the management incentive plan. The ORR has recently published a letter[48] consulting NR on whether it should be required to seek views on annual bonuses with funders and members. The Study considers that this is a positive step in improving transparency and should be taken forward. The Study also considers that the revised management incentive plans that NR is developing should be clearly focused on the key outcomes that its customers, ORR and Government want to see delivered – with a particular focus on real efficiency improvements that will reduce the industry's unit costs.

Strengthening incentives on TOCs

Section 5.3 (Outputs) describes a range of measures that the DfT could use to strengthen the incentives on train operators to reduce costs and to co-operate more effectively with NR towards that objective.

It is essential that changes of this nature are made in all new franchises and that consideration is given to introducing similar changes in existing franchises, e.g:

- longer franchises giving TOCs a greater sufficient independent to innovate and make investments with a payback beyond the current franchise term;
- use of output-based specifications, giving train operators greater flexibility to reduce costs of meeting output requirements;
- contractualised unit cost profiles to focus TOCs on cost reduction; and
- TOC cost benchmarking to ensure a continuous focus on cost reduction.

Incentivising better use of existing capacity

To reduce industry costs, it is important that there are incentives for NR and train operators to make best use of existing capacity. To some extent these incentives will arise out of the proposed amendments to the Route Utilisation Strategy (RUS) process described in the planning section. It is important that NR's timetabling and system operator functions are also properly incentivised. The Study considers that the industry should develop new measures of capacity utilisation (as described in the planning section (Section 6.2)). The railway network tends to focus on improving operational performance given the prominence given to the achievement of Public Performance Measure (PPM) targets. Performance is only one facet of the railway and there can be a trade-off between operational performance, capacity utilisation and journey times. To ensure the correct balance is struck, the Study considers that it is important that equal prominence is given to measures of capacity utilisation and possibly journey times, as is given to operational performance.

Furthermore, the Study considers that the ORR should examine whether it is possible to incentivise capacity utilisation further by, for example, changing the charging regime or setting explicit targets. This should build on the experience of incentivising system operators elsewhere (for example, Trasse Schweiz, the rail system operator in Switzerland, the National Grid which acts

48 Letter from Bill Emery to Steve Russell, 3 March 2011. This document can be accessed at www.rail-reg.gov.uk/server/show/ConWebDoc.10331.

as a system operator in the gas and electricity sectors, or NATS which is the system operator for UK airspace). As capacity utilisation and journey times are a function of NR's timetabling of train operators' service proposals, the Study considers that it may be appropriate for incentives to act on both NR and train operators, building on the success of joint performance improvement plans.

Better alignment between train operators and infrastructure managers

The structures section (Section 7.1) of this report sets out some measures for better alignment between train operators and infrastructure managers. Measures identified in that section included:

- combined TOC and infrastructure profit and loss accounts;
- joint route development and management groups involving train operators and Route IMs;
- cost and revenue sharing mechanisms between train operators and Route IMs;
- joint ventures or alliances between NR and train operators; and
- vertical integration of route-level infrastructure management and train operators.

In addition, the Study considers that the following measures may further improve alignment between train operators and infrastructure:

- The DfT should consider removing the Network Grant so that all Route IM funding comes through train operators (and property income). This would make it clearer that NR's principal customers are the train operators and would provide greater transparency over industry costs.
- The industry should extend the number of joint targets, building on the success of joint performance improvement plans and the recently introduced joint network availability targets. These could include cost reduction and customer satisfaction.
- The ORR should consider reviewing the existing financial incentive mechanisms in track access contracts (Schedule 4 possessions and Schedule 8 performance regimes) to ensure that train operators and NR have joint incentives to improve outcomes rather than simply protecting them from changes to the status quo.
- The ORR should review cross-industry incentives towards capital expenditure and, in particular, whether the regulatory asset base mechanism ensures that all parties (including NR, Government and train operators) have appropriate incentives to find the best capital or non-capital solutions.
- There needs to be clarity of responsibility and, as far as possible, overlaps should be removed. Train operators and the infrastructure managers need to be clear about who is responsible for which area and who is going to take action if no progress is made. The Study strongly supports the Government's plans to transfer the long-term management and development of stations, other than perhaps the largest ones, to train operators. The Study also considers that where there are cross-industry outputs these should be enforced by a single body, the ORR. This will ensure consistency of treatment across franchises and across the industry.

Improved incentives for the efficiency of enhancement expenditure

The Study considers that there need to be significant improvements in the contestability of enhancement expenditure to improve efficiency and value for money. While much expenditure (e.g. enhancements and renewals expenditure) is already subject to competitive tender, there is often a lack of contestability in the development and design stages of projects. Early and better engagement with train operators and suppliers has also been shown to increase efficiency and focus on the key outputs that customers want to see delivered.

The Study recommends consideration of the following changes:

- Mandating early cross-industry engagement as part of project development process, for example the IM should consider mandating early TOC and contractor engagement as part of the new programme delivery process.
- The ORR should consider introducing cost/risk sharing arrangements (such as an enhancement efficiency benefit sharing mechanism) which would ensure that TOCs and NR have incentives to optimise the costs and benefits of proposals.
- The DfT should consider using train operators to take forward the delivery of some enhancements (which could include mandatory joint ventures with Route IMs). This would ensure that enhancements met the needs of users and that both parties had an incentive to minimise costs. This would require the TOCs to take on some of the risks for service delivery so that they perform an effective clienting role. Train operators have, in some circumstances, been shown to be more efficient in the delivery of enhancements. Specifying outputs requirements in new franchises would allow operators to come forward with enhancement proposals (including joint ventures) in a competitive environment, which could lead to greater efficiency.
- The DfT should consider increasing the use of funds for specific objectives rather than specifying many individual projects to deliver the HLOS. This would build on the success of the National Stations Improvement Programmes (NSIP) and increase contestability of enhancement expenditure, as both train operators and IMs could bid for funding.
- The DfT should consider how TOCs could be brought more into the HLOS process. This is discussed further in the outputs section of the report (Section 5.3).

The effectiveness of such incentives for efficiency of enhancements will, of course, depend on the effectiveness of the incentives on NR as a whole.

7.2.7 Potential for, and timings of, cost savings

Potential savings from improvements in incentives have not been identified separately as they are seen as facilitating improvements elsewhere in the Study.

7.2.8 Implementation plan

It is important that, as far as possible, changes to incentives are introduced on franchise award so that the implications of any changes are properly built into franchise bids (Table 7.5).

Table 7.5: Implementation plan

Date	Action
Ongoing	New franchise specifications include cost and revenue sharing mechanisms, enhancement risk and reward sharing, and transfer of output enforcement to the ORR
2011–12	NR reviews corporate governance and introduces appropriate changes
	The DfT considers whether introducing mandatory joint ventures for enhancements would improve value for money and introduces arrangements into new franchises
	NR reviews GRIP process and mandates cross-industry engagement
	The ORR publishes joint industry profit and loss accounts by route and TOC
	The DfT reviews the HLOS process with a view to identifying appropriate funding levels and greater flexibility for delivery between train operators and NR
2011–13	The ORR reviews NR's incentives for capacity utilisation and introduces changes for the start of the next control period
	The ORR and the DfT review joint industry incentives, including those on capacity utilisation and journey times
	The ORR reviews cross-industry incentives for capital expenditure and introduces changes for the start of the next control period
	The ORR reviews incentives on the efficiency of capital expenditure and introduces changes as part of the next periodic review and in new franchises
	The ORR reviews financial incentives to ensure that they provide incentives to outperform rather than maintain the status quo
2014–15	The DfT considers removing the network grant from the start of the new control period

8. Area D – Revenue

8.1 Fares

8.1.1 Description of studies and analysis

The Study has been clear from the outset that its primary focus is on the rail industry's cost structure and barriers to efficiency. The Study has also examined ways of generating more revenue from ancillary activities such as better utilisation of property. The Report does not give any consideration to seeking solutions to the industry's financial challenges by increasing the level of fares overall.

Nevertheless, the fares structure is a key element in the railway system as it is the means whereby the capacity that the industry provides is priced to the passenger – the source of demand for that capacity. In that sense, the fares structure influences the way in which capacity and demand are matched, which is a key driver of efficiency.

Accordingly, the Study has focused on two main issues in relation to fares:

- the extent to which fares regulation constrains the ability of train operators to take commercial decisions that can make best use of capacity; and
- the scope for fares regulation to encourage relatively less travel during peak times and relatively more off-peak, in so doing, to address a key driver of costs – i.e. the need to provide additional capacity to service peak needs, which may then be underutilised in off-peak periods.

The Study team has drawn on external research studies, its own analysis and documentation published by various industry bodies. In addition, discussions were held with relevant stakeholders and evidence sought as to where opportunities exist to improve value for money.

8.1.2 Evidence base

The primary sources of research for this area were:

- Strategic Rail Authority (2003) *Fares Review*;
- AECOM (2007) *Saver Fares*;
- AECOM (2007) *Demand Management Techniques – Peak Spreading Studies*;
- Follow-up to AECOM study on peak spreading (2010);
- Steer, Davies, Gleave (2010–11) *Research Project on Fares*;
- Department for Transport (2011) *Creating Growth, Cutting Carbon*;
- ITS and AEA (2001) *Surface Transport Costs and Charges*; and
- Passenger Focus (2009) *Fares and Ticketing Study*.

In addition, this area has been informed by stakeholder working groups, discussions with relevant industry parties and Passenger Focus, as well as submissions received from interested parties.

8.1.3 Background information and key data

Total fares revenues in Great Britain amounted to £6.2bn in 2009/10. Of this, about £1.6bn was related to season tickets. There were 1.26bn journeys and the average fare paid was £4.91, up 4.2% on the year before. Of the total £6.2bn of revenues, Long Distance operators accounted for £2.2bn, London & South East operators for £3.1bn and Regional operators for £0.9bn. Each year 300 million fares are defined by operators, processed by regulatory and industry systems and made available for sale, but the overwhelming majority are never used because they relate to journeys which are never made.

Fares (Price Cap) regulation currently applies to standard class weekly season tickets and most commuter fares in and around London and certain other cities. Additional regulation applies to off-peak fares and standard return fares where there was no Saver (off-peak) fare in 2003.

Table 8.1 shows a simplified version of the overall fares structure. The yellow shading indicates the regulated categories, and the orange blocks are what may be considered "quasi-regulated" fares. The fares above the top yellow blocks are unregulated.

Table 8.1: Fares comparisons

Long distance		Short distance	
Single	**Return**	**Single**	**Return**
First Anytime		First Anytime Day	
First Advance			
Standard Anytime		Standard Anytime Day	
Standard Off-Peak		Standard Off-Peak Day	
Standard Super Off-Peak		Standard Super Off-Peak Day	
Standard Advance			
Season tickets			
Railcard-discounted fares			

Note: Sometimes the Standard Super Off-Peak Return is the regulated off-peak fare.

Regulatory fares caps are set with reference to the Retail Prices Index (RPI) through an "RPI + X%" regulatory system which imposes two types of cap on operators:

- A "commuter fares" basket containing all flows by designated ticket type from which the Train Operating Company (TOC) gains revenue (derived through reference to a base year). The types of fares covered in London are;
  - weekly, monthly, quarterly and annual seasons to and from the London Travelcard area; and
  - open singles and returns within the London area and to the London area from a defined area up to 50 miles around it.
- A "protected fares" basket, outside commuter areas, containing fares which had once been regulated individually. These include:

- weekly seasons; and
- Savers or (where Savers did not exist before February 2003) the equivalent full fare return ticket (such fares also have other restrictions, e.g. valid for at least a month, all day weekends, from no later than 10.30am on any other day).

Within the overall basket limit (currently RPI + 1%) individual fares can increase up to a separate cap (currently set at RPI + 1% + 5%). This provides an element of flexibility for TOCs to manage demand (although not enough to provide a strong mechanism to deliver significant movement of passengers away from peak times). As well as price regulation, the regime also places certain restrictions on other aspects, such as the time of travel on various tickets.

This overall approach reflects, to some extent, the fact that there are different markets within the rail network:

- commuter markets – where competitive pressure on TOCs is relatively weak and capacity is under pressure (inelastic); and
- commercial markets (e.g. long distance, InterCity, some regional) – where passengers already have some protection because operators are constrained by competitive pressure from alternative modes (elastic).

It should be noted that raising fares (unlike most other sources of revenue gain or cost reduction) often involves offsetting disbenefits which may need to be taken into account. For example, raising fares may induce passengers to travel on alternative rail services which are not their first preference, or on other modes which involve social costs (e.g. road congestion and pollution). However, as explained below, well-designed fares changes can potentially bring about performance improvements such as lower crowding and cost savings from deferring network capacity expansion.

8.1.4 Barriers to efficiency

Wider fares issues

The Study's analysis has identified a number of anomalies and disincentives related to fares policy. Although these issues are not directly related to value for money, the Study feels that they serve as potential barriers to a fully economically efficient fares regulatory system. These issues are as follows:

- Regional imbalances – the current system of fares shows significantly different levels of fares and subsidies across the GB regions (for equivalent journey lengths).
- Fares not reflecting the cost of enhancements – there is an argument that, where exceptional new investment is required (and eventually delivers passenger benefits), fares levels – once this investment is committed, but even before it is delivered – should reflect the cost of that new benefit. This could apply where new franchise arrangements mean that TOCs will have a closer involvement in capital expenditure decisions (both network and rolling stock).
- Season tickets distance taper – a long standing feature of the fares structure is that season tickets become progressively cheaper (on a pence per mile basis, and relative to other fares) as journeys get longer.
- Complexity – there is clear evidence that the complexity of fares – partly driven by the regulatory structure – makes rail a less attractive proposition, with possible implications for overall ridership.

- There is strong evidence that passengers would value more simplicity in the fares offered. Research carried out by Passenger Focus has shown that there is low awareness of the different ticket types available and little understanding of the benefits or restrictions of each, making it hard for passengers to determine best value for money. This research showed that passengers would welcome greater clarity and transparency in the setting of fares, and more information as to the rationale behind different rates. Although this is essentially an issue of wider fares policy, a number of the advantages of smart ticketing described below also help address this issue.

These issues do not fall within the primary focus of the Study, but – given their importance to passengers – the Study feels there is merit in the Department for Transport (DfT) reviewing them further. As part of this review, the DfT should also consider the extent to which fares regulation (particularly of Saver fares) constrains the ability of train operators to take commercial decisions, which can make best use of capacity. Fares regulation on those parts of the network which are subject to competition from other modes presents a barrier in two ways:

- first, it means that some fares in markets are below levels which the market would otherwise deliver; and
- second, it constrains yield management systems, such as those prevalent in the aviation sector, which can assist better use of capacity.

The last formal review of fares regulation, which was undertaken by the Strategic Rail Authority (SRA) in 2003, highlighted – among other things – that regulated fares might be significantly below their economically efficient level, and that the regulation of Savers had caused spurious demand peaks at certain times of day. This, in turn, had led to significant overcrowding on some trains.

These findings have been strongly endorsed through the Study's workshops and interviews with industry representatives, especially those serving InterCity markets, who argue that their ability to "grow the market" is hampered by constraints imposed by fares regulation, particularly in relation to Saver fares.

There are also constraints in relation to the development of market- sensitive yield management capabilities. Although there is evidence that long-distance TOCs have developed such capabilities, their application is limited by the relationship between advance purchase tickets (unregulated) and Saver tickets (regulated).

Under yield management systems favoured by TOCs, advance purchase fares levels would range from 90% to 10% of the Standard anytime single and would cover a wider pricing range than the usual three-tier Standard, Off-Peak and Super Off-Peak structure. By deciding when/whether a particular fare applies, operators could develop systems to revise prices at intervals before the departure date of a particular train, depending on whether demand appears to be weaker or stronger. The aim would be to optimise fares revenue at a market level, by charging higher fares on busier trains and lower fares on less busy ones. This could provide better value for money by increasing revenue (improving yield to the operator), smoothing capacity utilisation and reducing overcrowding (providing incentives for people to move from busy trains to less busy ones). If done well, it offers a more flexible product to passengers.

However, for such an approach to work properly, TOCs need to have the ability to charge higher fares on busy trains (with offsetting reductions for under-loaded ones). The existence of regulated fares – which put a limit on such higher fares – represents a barrier to the full use of yield management techniques, and a barrier therefore to the efficient use of capacity.

There is evidence that passengers, while naturally wary of fares increases in isolation, value reductions in crowding, improved reliability and clarity/flexibility of fares products, all of which could be expected to bring a more market-driven approach to fares.

Fares regulation is too inflexible to tackle the key value for money issue of peak demand. Fares regulation and outmoded ticketing techniques mean that operators cannot offer the sort of flexible "tiered" fares regimes that could encourage some passengers to move to less crowded services. This, in turn, stifles the opportunity to reduce the costs to the rail network of servicing a heavily utilised peak:

- A key cost driver for TOCs is the need to service peak travel times, which can mean that the rolling stock (and staff) required to service a heavy peak are under-utilised for the rest of the day. Analysis carried out by the Study has demonstrated that a "predict and provide" approach to peak demand has, in some cases, led to poor value for money through the need to provide costly capital expenditure solutions such as rolling stock or infrastructure enhancements, within a GB rail system where capacity utilisation by passengers is lower than in comparator countries.
- It follows from the above that there is potential value for money benefit from encouraging those passengers who have the flexibility to travel outside the peak to do so. Pricing is a normal way to provide such incentives, but current fares regulation provides a barrier to this and, indeed, can create perverse incentives of its own.
- In a wholly unconstrained market, a rational approach to the phenomenon of very sharp surges in demand during rush hours – referred to as "peak demand" (and within the peak a further distinction between "core" and "shoulder" peaks, either side of the most crowded 60 minutes) – would be to use fares to maximise revenues and, at the same time, encourage passengers to switch away from travel at times of peak demand. However, to achieve anything approaching "full" switching within the current fares system – such that demand was level across the whole day – could require significant peak fares rises.
- There nevertheless remain potential and significant benefits from moving some way towards the concept of peak spreading – even moderate movements in this direction may be a better value for money solution than expensive capacity enhancements.
- Currently, fares regulation does not allow the sort of flexible pricing that might be used to deliver peak spreading. Indeed, analysis carried out on behalf of the Study shows that it can create perverse incentives, e.g. the "peak" problem does not just occur in relation to daily commuting, but also applies to important inter-urban travel at times when regulated Saver fares apply. An obvious example is the Friday evening departures from London on some routes, when the lower Saver fares apply from 7pm. The first service following this threshold is subject to very heavy overcrowding, in what is often referred to as a "spurious" peak – an unintended consequence of current fares regulation. Services before the threshold are relatively underutilised.

The current low availability of Smart ticketing puts a limit on the potential benefits of fares deregulation and the development of new products. The rail sector operates largely on a paper-based ticketing system, which means that it does not benefit from the potential advantages of emerging Smart technologies and the dramatic new opportunities these present. Options which could help address the barriers highlighted above include differential pricing by precise times within what are, currently, single "peak periods" (e.g. allowing "core peak" versus "shoulder peak" pricing, or indeed more price tiers), flexibility for season ticket holders, and a clearer, more flexible,

offer for potential passengers. The inability to introduce such flexibilities presents a major barrier to value for money.

8.1.5 Principal issues

Reducing the coverage of Saver fares

An important element in enabling operators to take more commercial decisions would be reducing the coverage of Saver regulation where it constrains TOCs from adopting sophisticated yield management techniques at certain times of the day or on particular days of the week. The SRA's 2003 *Fares Review* highlighted the fact that TOCs often face a competitive market for this type of ticket and that passengers can often choose alternative forms of travel if operators do not offer attractive fares. It suggested that there was a case for significant deregulation of non-commuter fares. Despite these findings the SRA did not press for wholesale Saver fare deregulation, and neither did the 2007 Rail White Paper.

Bearing in mind the financial burden of adding peak capacity to the network, and the fact that passenger utilisation of train capacity in GB appears to be relatively low, the Study believes that these ideas are still worth pursuing as part of a wider DfT review of fares policy and structures..

Further fares deregulation to encourage more effective demand management

Saver deregulation would improve capacity utilisation in the off-peak and would help tackle perverse incentives, but further deregulation would be necessary to encourage more peak spreading – and, even then, would, in the longer term, need to be accompanied by widespread use of Smart ticketing (see below).

The Study has noted three points:

- peak spreading is primarily an issue for commuter markets, where passengers would still need to be protected by an overall cap;
- the Study's finding (in common with most other studies) that large individual changes to core peak fares, balanced by significant reductions elsewhere, and/or a tiered approach to peak/shoulder peak/off-peak fares levels, would be necessary to provide the incentives to deliver effective peak spreading; and
- that TOCs are best placed to make such trade-offs.

These suggest that the detailed operational knowledge of TOCs themselves should be harnessed to achieve optimal rebalancing, with the overall level of fares still constrained by the fares basket limit. Currently, TOCs do have some flexibility on relative fares within the overall basket – individual fares can rise by an extra 5%[49] over the "RPI + X%" formula – but the Study considers that the current mechanism could be improved by removing this additional cap on individual fares whilst retaining the overall basket cap.

This measure could begin to encourage peak spreading, if TOCs used it flexibly to send the right pricing messages. It could give TOCs some additional, albeit limited, freedom to make decisions as to how to manage demand, but raises a further issue in relation to TOC incentives to address peak spreading. There is a risk that TOCs (particularly within existing franchises) might not be able or willing to introduce demand management, and would simply charge high fares on busy services

49 This applies to all TOCs, except Southern, for which the limit is 2%.

across the whole peak and accept the continued overcrowding that could accompany it. To address this, the DfT might need to introduce measures along the following lines:

- for some TOCs, removal of the current distinction between "commuter fares" and "protected fares" baskets could allow more flexibility regarding trade-offs within the baskets;
- commuter fares baskets could be widened to include off-peak fares, where their future reductions could be used to off-set increases in peak fares; and
- additional incentives on TOCs may be helpful, such as financial penalties for exceeding over-crowding limits on specific services or positive incentives for raising usage on less crowded services.

Smartcards

In the longer term, the most powerful enabler for demand management is likely to be Smart ticketing. Smartcards potentially offer many benefits. These include:

- Options to charge different fares at specific times of the day – e.g. TOCs to set different "high peak", "shoulder peak" and off peak prices (and in principle other gradations of price), with the aim of encouraging time switches, thereby allowing more fine-tuned "demand management" and all the associated benefits of peak spreading.
- Charging differentially for season tickets other than those based on a standard five days per week – enabling different charging structures, for example, "three-day per week commuters" (to suit those working part of each week at home), or address peak travel issues by specifying that, for example, one or two days per week must involve off-peak travel.
- Collection of detailed and accurate data on travel patterns (including by fare and time of day) – this would benefit rail analysis, forecasting and planning, and the calculation of revenue shares where two or more TOCs run services on the same routes.
- The ability to support specific fares concessions – e.g. not just "free travel" for eligible groups, but also a specific benefit, such as a fixed £300 price reduction in off-peak travel per year. This could allow well-targeted protection of vulnerable groups who may lose under certain aspects of other proposed fares changes.
- Addressing complexity and providing clarity – the Study has found that current fare structures are too complex. Although the reduction in regulated Saver fares might simplify matters, the sort of tiered fares approach necessary to manage demand – and made practicable with Smartcards – could add additional complexity (e.g. if there was a range of fares available depending on time of travel). This need not represent an overwhelming barrier if accompanied by:
  - safeguards (as with the London Travelcard) – by offering the reassurance of an overall cap, whatever the mode, time, ticket type of various fares that made up a person's travel on a particular day; or
  - clarity of presentation (as with the purchase of airline tickets) – in this respect best-practice in the industry is already focused on the need to give a clear, understandable offer to the passenger; or
  - improved information and booking systems for passengers (see Box 8.1).

Box 8.1: Case study – Innovative marketing can drive ticket sales

East Midland Trains redesigned its online ticket booking website in the autumn of 2009. The key aims were to improve customer experience in two main ways: simpler transactional process and clearer display of fares and information at the marketing-led front-end. A major element was the introduction of a "Best Fare Finder" planning tool (delivered using the Trainline.com booking engine), which, according to East Midlands Trains, has had the following results:

- 63% increase in volumes through the site since launch;
- 30% improvement in conversion across the site;
- 49% increase in other train operator sales via the site, thanks to the nationwide "Best Fare Finder";
- 5% overall increase in average transaction value (ATV);
- 5% gain in market share for eastmidlandstrains.co.uk; and
- 7% increase in value for money National Passenger Survey ratings for East Midlands Trains.

In the ways described above, Smartcards offer a range of fares options and potential benefits. The Study understands that the DfT has put in place pilot trials with several TOCs under recent franchise agreements. These studies may give some early evidence regarding potential effects of new and flexible fares on peak spreading and should be followed closely, with similar trials specified in forthcoming new franchises.

8.1.6 Recommendations for cost reduction (or revenue enhancement)

The Study recommends the following:

- The DfT to undertake a full review of fares policy, covering all the issues highlighted earlier in this section, i.e. regional imbalances, anomalies, relationship between fares and the cost of enhancements, season ticket regulation, and the overall complexity of the ticket range arising from regulation.
- As part of an overall review, the DfT should give particular consideration to:
  - how fares can be used to aid management of peak demand through more flexible fares structures, "intelligent ticketing", and possibly reducing the coverage of Off-Peak/Saver fares where operators are competing with other modes of transport, e.g. on InterCity services;
  - removing the cap on individual fares within the overall fares basket, thereby providing more commercial freedom, allowing TOCs to adjust fares between the peak and shoulder peak, and to introduce a limited amount of peak spreading; and
  - reviewing other aspects of the fares basket mechanism, with the aim of further reform, including removal (for some TOCs) of the distinction between "commuter fares" and "protected fares" baskets, a widening of commuter fares baskets, or, additional incentives on TOCs such as penalties for exceeding over-crowding limits, or rewards for raising usage on less crowded services.

- The DfT to work with one or more TOCs (and Transport for London (TfL)) to identify a potential "pilot" project on a congested commuter route to introduce "Smart" season tickets with improved fare structures to incentivise peak spreading.
- The DfT to explore with TfL the possible interactions (commercial and technical) with the London Travelcard Area, especially where Travelcard fare levels act to put a cap on the higher peak fares which TOCs might need to achieve some degree of peak spreading.
- The DFT to work with the industry to accelerate widespread take-up of Smartcards, with the DfT mandating the developments as far as possible, and the proposed Rail Delivery Group addressing the issue as a matter of urgency.
- The proposed Rail Delivery Group, working with ATOC, to promote best-practice in the use of improved technology to sell tickets, improving the clarity, transparency and rationale behind different ticket prices, and expanding retail channels.
- In implementing other proposals in this report for the Office of Rail Regulation (ORR) to take more responsibility for regulating franchises, the DfT to consider whether the extent to which fare regulation – within a policy framework set by the DfT – could also be carried out by the ORR.

The Study wishes to emphasise that the recommendations above are made on the basis that there clearly is scope for fares structures to assist in matching rail capacity and passenger demand more efficiently. There is clearly also scope for fares structures and ticket retailing to be adapted better to meet the needs of today's market and today's passengers.

The recommendations are **not** proposed as a means whereby the overall level of fares is increased. While some fares would increase, other fares would decrease correspondingly, within unchanged limits overall. The Study has indicated in Section 4.12 (International Benchmarking) that GB rail fares are some 30% higher than European comparators, and the whole thrust of the Study is towards reducing costs and therefore reducing the upward pressure on fares.

8.1.7 Potential for, and timings of, cost savings

More effective demand management, through removing the cap on individual fares within the baskets, and leaving TOCs freer to adjust individual prices according to market conditions (combining increases with decreases to remain within the total cap), could, based on initial modelling, generate additional revenue by attracting additional off-peak traffic. Another benefit of this reform would save an estimated £32m per annum, arising from enhancement spend foregone (due to better utilisation of train capacity).

8.1.8 Implementation plan

The DfT should announce a review of fares regulation as a matter of urgency, with initial findings informing its White Paper in November.

The DfT is currently funding a programme to facilitate the acceptance of Integrated Transport Smartcard Organisation (ITSO) cards issued throughout the country within London, increasing the scope for smarter ticketing. In this respect, proposals for more flexibility in London would be very much dependent on the relationship with TfL prices. This, and the fact that implementation may need to await the widespread adoption of Smartcard technology (which is planned anyway in the London area in 2013), means that the DfT would need to engage with TfL as a matter of urgency.

8.2 Property and development

8.2.1 Description of studies and analysis

An issue for the overall value for money of the industry is whether the proper conditions exist to allow revenue to be maximised. This section addresses Network Rail's (NR) scope to maximise yields from property and development.

The Study has drawn on external research studies, its own analysis, and documentation published by various industry bodies. In addition, discussions were held with relevant industry parties and passenger groups, and evidence was sought as to where opportunities exist to improve value for money across the industry.

8.2.2 Evidence base

The primary sources of research for this area were:

- DTZ (2010) *Report on Rail Industry Property Assets and Potential*;
- Penfold (2010) *Review of Non-planning Consents*;
- NR's various internal confidential working papers made available to the Study, including consultancy work reviewing the NR organisation in relation to commercial property; and
- Department for Communities and Local Government (2001, updated 2011) *Planning Policy Guidance 13: Transport*.

In addition, this area has been informed by stakeholder working groups, discussions with and submissions received from interested parties.

8.2.3 Background information and key data

For NR, the main sources of revenue (outside regulated income from the core of its business activities) are property and development opportunities. In terms of NR's property assets, the company is incentivised through its regulatory structure to generate revenue, and already has an active programme in place to pursue increased revenue, although it should be noted that many of the available benefits from disposing of rail assets were achieved in the years following privatisation, and those remaining present a greater challenge to achieve.

There are two potential sources of additional revenue which could benefit the industry:

- The largest single category of potential property income identified by the Study's analysis is from the sale of surplus freight sites currently owned by Freight Operating Companies (FOCs), where NR is the freeholder, which could be disposed of to generate proceeds which would be divided between the public purse (via NR) and the current leaseholder (mostly, DB Schenker (DBS)). These have an estimated potential benefit of about £145m to £285m (to NR and the FOCs, possibly realisable over a five-year period).
- Further property related income could accrue if the British Railways Board (Residuary) Ltd (BRBR) portfolio, inherited from the pre-privatised network, was sold/transferred to NR, allowing development and sale of key assets such as Waterloo International (which could achieve a sales value estimated at around £37.5m) and the Manchester Mayfield Depot. Significant development potential also exists within or adjacent to the London Victoria site.

8.2.4 Barriers to efficiency

The Study has concluded that the current regulatory incentives for maximising revenue from property are relatively strong. That said, the potential benefits from the property-related opportunities highlighted above have not yet been factored into revenue streams, and there are potential barriers – leading to delay/risk – as a result of the following:

- NR may not be optimally structured to exploit its property portfolio to its fullest extent. This is because property development or disposal is not a core part of the railway business and a more specialised business unit might provide a stronger focus.
- Licensing barriers in relation to freight sites, particularly the ORR's Licence Condition 7, which stifle FOCs' ability to dispose of their own property assets (with approximately half the revenue accruing to NR).
- Out-of-date statutory powers of purchase mean that NR can be forced to pay above market prices for land or access needed for network operations. The Study considers that Land Acquisition Powers for NR are antiquated (dating back to the Railway Regulation Act 1842) and are not fit for purpose, leaving landowners able to extract ransom payments for access to key sites for repairs, enhancements and developments; a situation which does not exist in respect of other utilities (e.g. Water). NR estimates that this situation adds at least £5m per year to its (land acquisition) costs.
- The planning framework, particularly in relation to some heritage considerations, can lead to excessive constraints, complexity and cost in works at some sites and stations. The Penfold Review has recently highlighted the way in which "non-planning consents", while helping to achieve Government aims such as protecting endangered species or the well-being of local communities, can also present obstacles to development and growth.
- The Penfold Review highlighted the complexity and fragmented nature of the current system, and the difficulties arising from the way the "non-planning landscape as a whole interacts with planning". Among the issues identified as most in need of reform were "Heritage Consents" (which include listed building and scheduled monument consents). This is an area NR has noted as a potential obstacle to certain station-based activities which could raise revenues (e.g. advertising signs) or reduce costs (redesign a station's layout). Although NR has "privileged permitted development rights" which speed much of its operational or improvement activity by negating usual planning permission requirements, this does not extend to the historic or listed building environment.

In all of this, the need to safeguard some sites for future rail development will need to be borne in mind.

8.2.5 Principal issues

NR organisation

Given the opportunity – and scale – of potential revenue benefits from NR property-related income, the Study has considered whether the organisational structure by which property is managed, and in particular sales and/or development is managed, itself could be changed to improve incentives – e.g. whether a separate company within NR, or a joint venture or third-party company, could derive benefits of specialisation and access to more external funding.

Analysis suggests that, while NR's current property organisation is performing well, further consideration needs to be given to the question of whether further gains could arise from organising the property activities into a "separate entity", and, if so, which specific assets should be included and which ownership structure (including possible external third-party equity) would be best.

A separate property entity could support revenue maximisation through:

- discrete and visible accountability;
- increased focus on customer service and improved processes and speed of reaction to business opportunities;
- management efficiency and effectiveness which should improve with the need to report performance to shareholder(s); and
- increased commercialisation and risk-taking attitude.

The Study has concluded that NR's property operations should be established as a separate entity, designed to benefit from discrete financial performance and greater focus.

There are arguments for and against this entity remaining 100% owned by the NR group. Where external partners are involved at the equity ownership level, incentives and commercialisation may sharpen, but there may be some need for extra awareness of rail operational needs. Tax implications may also need careful consideration to ensure that the public interest and NR's tax position (e.g. in respect of disposals) are aligned.

In the past, NR development projects have been conducted jointly with external partners on a site-by-site basis. For the future, it is important to consider whether this is the best model for involving external partners, or whether a private-sector partner should be brought into the new property entity as part (probably minority) owner of the new property entity. This issue warrants further detailed consideration.

Co-ordinated action to ensure unused rail freight sites are confirmed and prepared for sale

NR has proposed that a "Freight Land Utilisation Framework" could facilitate the agreement of stakeholders through consultation (rather than legislation). The Study welcomes this approach. Such a framework should enable land surplus for freight use to be released for alternative use or development and should include the following:

- A time limit (e.g. six months) on the consultation period to establish and agree that a specific site is surplus to industry need (subsequent disposal will still follow the current regulatory procedure as in Licence Condition (LC) 7).
- Consider allocating a percentage of sales proceeds to a "freight investment fund" to be used to support the creation of new freight facilities in more suitable locations (criteria for the use of such funds to be agreed within the industry).

Licence Condition 7

On the specific issue of freight land sales, the Study has concluded that the ORR LC7 sets out procedures which may be considered unnecessarily burdensome and time-consuming. There is

scope for these to be amended with the aim of speeding up the sales process, while retaining necessary protections.

Land acquisition powers

NR often needs to buy land for temporary or permanent access, and is often "held to ransom" and forced to pay excessive prices. The best solution, although one which may be for the longer term, would be new legislation to grant NR the necessary statutory powers to acquire temporary or permanent interests in land owned by third parties. As a shorter-term solution, NR considers that there is scope for a revised application of the 1842 Act, which would allow a streamlined process to improve matters, at least on an interim basis.

Planning processes

Similarly, the planning and heritage framework is overly restrictive for many of NR's properties which are listed or of "historic importance". The overall framework is also excessively complicated and fragmented, but these issues are being addressed by the Penfold Review which has made a range of recommendations to address these issues by streamlining the whole area of "non-planning consents", also combining all consents regarding "historic assets" into a single area, and generally introducing a lighter touch to regulation.

8.2.6 Recommendations for cost reduction (or revenue enhancement)

The Study recommends the following:

- NR to review the scope to organise its property interests into a fully separate property entity, to examine the pros and cons of introducing private-sector equity into this property entity, and to consider which type of third-party partner would be optimal (e.g. a passive investment fund or a private-sector property development company).
- NR to begin the process of selling freight properties no longer necessary for rail operations. This will require identification and agreement of specific sites, most currently leased to DBS. NR proposes establishing a "Freight Land Utilisation Framework" (including an element of sales proceeds sharing) to facilitate agreement of all stakeholders.
- NR and stakeholders to resolve issues of divided ownership and governance of key sites prior to large-scale development (especially at Waterloo and Manchester).
- The ORR/DfT to review LC7 with a view to streamlining/improving procedures to facilitate the disposal of freight facilities and land sites not needed by the industry, while maintaining protections to ensure that land with a realistic prospect of future rail freight use is retained for that purpose.
- In the longer term, the DfT to explore scope for new legislation to grant NR stronger land acquisition powers (as highway and utility providers have now). In the shorter term, to support NR in its attempt to use the existing Act in an "improved process" as per its recent QC legal guidance.
- The Department for Business, Innovation and Skills (BIS) and the Department for Communities and Local Government (DCLG) to continue implementation of the Penfold Review

recommendations, particularly on simplifying the non-planning consents landscape by removing some individual consents and rationalising others.

In all of this, the need to safeguard some sites for future rail development will need to be borne in mind.

8.2.7 Potential for, and timings of, cost savings

The Study has identified the following sources of potential additional revenue:

- Surplus Freight Property asset sales are perhaps the largest single source of additional revenues identified here. Between £80m and £150m could be realised by NR for the public purse (and between £65m and £135m for the FOCs) over a number of years.
- Rail property development – the largest potential identified scheme is at Waterloo. This could generate (gross) sales value of around £38m, but would require time and construction expenditures first. Other property opportunities exist at Manchester and London Victoria termini, but values are not yet estimated, and are highly dependent on wider real estate market trends.

8.2.8 Implementation plan

Implementation of the above recommendations would be through early action by the parties concerned, particularly NR.

NR's relevant property activities should be grouped, as an early action, into a separate entity, with greater financial transparency through separate financial accounts. As part of implementation of this reform, consideration should be given to the issue of whether this should remain wholly owned by NR or if there would be net benefits from introducing some third party or private-sector involvement into this new entity (rather than as now involving the private sector on a case-by-case basis).

Freight site sales should begin at an early date, with the Freight Land Utilisation Framework set up under the Rail Delivery Group, and NR and DBS should begin detailed planning for disposal of their surplus sites.

To expedite major developments currently held back by divided ownership issues, the DfT should begin discussions for a settlement between BRBR and NR on Waterloo International Terminal as soon as possible.

The ORR and DfT should begin a review of LC7 immediately.

8.3 Car park facilities

8.3.1 Description of studies and analysis

This section looks at the opportunities for TOCs to increase revenue from the provision of car parking facilities.

The Study team has drawn on external research studies, its own analysis, and documentation from various industry bodies. In addition, discussions were held with relevant industry parties and passenger groups, and evidence sought as to where opportunities exist to improve value for money across the industry.

8.3.2 Evidence base

The primary sources of research for this area were:

- Professor Sir Peter Hall and Chris Green (2009) *Better Rail Stations*; and
- Confidential working papers provided by a TOC, NR and the DfT.

In addition, this area has been informed by stakeholder working groups, discussions with relevant industry parties, and the submissions from interested parties.

8.3.3 Background information and key data

Adding car parking facilities at stations is a potential source of additional revenues to TOCs, and leads to increased value to the DfT of the franchise asset base. In principle, there are two main types of revenue benefit:

- revenue from parking fees; and
- additional rail fares where travellers are encouraged onto the rail network specifically because extra parking is available (realising so-called "suppressed demand").

There are currently 2,513 stations in the UK and about 150,000 station parking spaces. Only 25% of stations have more than 50 car parking spaces. The Study's own estimates, using the range of estimated values for "suppressed demand" as in the Passenger Demand Forecasting Handbook (PDFH) 2005 indicate that each extra 10,000 spaces might add to total farebox revenues by between £9m and £34m per year. It should be noted, however, that the wide variety of localised demand and supply conditions means that each station is likely to have unique characteristics and that it is very difficult to generalise regarding costs and benefits.

8.3.4 Barriers to efficiency

Train operators should, in theory, be incentivised to maximise revenue yield through the franchise process, but barriers exist in the following areas:

- Short franchises act as a disincentive for car park development with high up-front investments and significant pay-back times. This undermines individual business cases, particularly in the development of car parking facilities which can involve considerable costs, both capital (site acquisition and construction) and revenue (operations, ticket issuance and enforcement, site security and staffing).
- Revenue support arrangements in franchises disincentivise some TOCs from investing heavily in revenue generating activities – as highlighted in Section 5.3.
- Many local authorities have local transport strategies which deter rather than encourage the use of cars to travel to stations. Local authorities have reacted to concerns over air quality and road congestion by developing strategies to increase the use of public transport and reduce reliance on private cars (a strategy supported by central Government guidelines, such as those in PPG 13: Transport). This may have had the effect of deterring the expansion of parking spaces in towns and cities, including at stations. Similarly, highway planners sometimes have concerns that the expansion of parkway station car parks could put extra traffic pressure on specific motorway junctions.

8.3.5 Principal issues

The Study has concluded the best way of capturing revenue gains from car park investment is to ensure that TOCs have effective incentives to find and implement the best solutions suited to each of the stations within their franchises. The Study also considers that the best way to address the barriers highlighted above is through longer franchises which allow longer pay-back times to offset high up-front costs. Other measures in this report – such as longer, output-based, franchises and the removal of the revenue support mechanism – are intended to facilitate greater uptake of investments such as car parking facilities by providing greater incentives for TOCs to grow their markets and improving the individual business cases for such initiatives.

There may also be a case in future planning guidelines to ensure that planning and local authorities take a more nuanced approach to parking expansion (both at town locations and parkways), where this can support modal shift onto rail, even at the expense of relatively short initial car journeys.

8.3.6 Recommendations for cost reduction (or revenue enhancement)

The Study recommends the following:

- As proposed elsewhere in the Study, longer franchises, and a more flexible business model, should be introduced to incentivise TOCs to make long-term investments related to car parks and other activities which involve significant up-front costs with long pay-back times.
- When transport planning guidelines are next reviewed, consideration should be given to the benefits that increased station parking could bring in terms of a modal shift onto rail – even at the expense of more local journeys, and local authorities could be given more flexibility in this respect.

8.3.7 Potential for, and timings of, cost savings

Additional car parking (by adding a further 10,000 spaces) could generate £38m over five years.[50] As this Study has progressed, provision of 9,500 spaces has been incorporated by NR into its Control Period 4 (CP4) forecast and CP5 submission. Separately, the improved management of car parking could generate additional revenue of an estimated £3m per annum.

8.3.8 Implementation plan

Implementation of any measures to improve revenues from stronger TOC incentives/flexibilities would be through new franchise mechanisms and would be implemented in line with DfT's franchise timetable.

8.4 Ticket barriers/gating

8.4.1 Description of studies and analysis

This section looks at the opportunities for TOCs to increase revenue from the provision of ticket barriers/gating.

50 NR have pointed out that this would be very difficult to achieve without TOC support.

The Study team has drawn on external research studies, its own analysis, and documentation from various industry bodies. In addition, discussions were held with relevant industry parties and passenger groups, and evidence was sought as to where opportunities exist to improve value for money across the industry.

8.4.2 Evidence base

The primary sources of research for this area were:

- Professor Sir Peter Hall and Chris Green (2009) *Better Rail Stations*;
- Passenger Focus (2009) *Fares and Ticketing Study*;
- ATOC (2010) *Ticket Gates*; and
- the DfT's Confidential Gating analysis.

In addition, this area has been informed by stakeholder working groups, discussions with relevant industry parties, and the submissions from interested parties.

8.4.3 Background information and key data

Evidence suggests that the widespread introduction of gating at stations could reduce revenue lost through ticket evasion or the deliberate purchase of "wrong" tickets. Some of the revenue aspects of gating are similar to those of car parking – potential revenue gains from lower rates of "ticketless" and "wrong ticket" travel, but high initial capital costs of introducing the gates, and also ongoing revenue costs of their maintenance and operation.

The DfT data regarding rates of ticketless travel suggest it is about 12% in London compared with about 7% elsewhere. The Association of Train Operating Companies (ATOC) study and other studies also find that ticketless travel rates tend to be much higher on non-InterCity routes (as the latter have ticketless travel rates as low as 1% or less).

Looking at the revenue impact of gating, it is likely that there may be potential gains at a number of stations, even if most of the larger ones are already gated. Potential revenue gain will depend on the nature and quantity of journey types at each, and the feasibility of gating will also depend on the specific characteristics of station lay-outs. However, there are several ungated stations in London, which initial modelling suggests could generate an extra £270,000 per annum of gross revenues. Outside London, the 20 largest appear to offer gross revenue gains in excess of £500,000 or more each. However, given the complexities involved, these figures might represent a challenge to achieve.

8.4.4 Barriers to efficiency

As with car parking, TOCs should, in theory, already be incentivised to maximise revenue yield, but similar barriers exist:

- short franchises act as a disincentive with high up-front investments with long pay-back times;
- for TOCs in revenue support, the incentive to invest in order to capture a larger share of lost ticket sales is substantially diminished; and
- investment decisions on gating made by the DfT during franchise procurement cannot take account of the complex factors relating to individual business cases – costs related to business decisions at individual stations will often depend on factors such as size and the physical lay-

out of the station, including retail outlets and interruptions to footfall due to new barriers. Barriers may also imply a need for additional staff to manage or assist with passenger flows..

This problem is exacerbated by the fact that multi-user stations often make it harder for any individual party to develop a strong business case.

Another complicating factor is that heritage and planning constraints often lead to delay and cost in making a business case, depending on local circumstances.

In addition, revenue benefits will depend on factors such as passenger volumes, and journey length and type. Importantly, longer journeys will have more on-train ticket inspectors, and a lower rate of ticketless travel than shorter journeys.

These factors represent a barrier to detailed investment decisions being made by the DfT as part of its franchise specification, as these decisions are essentially ones which can only be made on a detailed case-by-case basis.

8.4.5 Principal issues

As with car parking, the Study has concluded that the best way of capturing revenue gains from such investments is to ensure that TOCs have effective incentives to:

- find and implement the best solutions suited to each of the stations in their franchises;
- grow their markets; and
- improve the individual business cases for such initiatives.

In addition, for gating investments at the larger, NR-managed, stations, proposals in this report to improve alignments with TOCs and for improving efficiency incentives should give added impetus.

There may also be a case for future planning guidelines to ensure that planning and local authorities take a more nuanced approach to the heritage, and other, planning constraints which might cause an obstacle to some gating proposals.

8.4.6 Recommendations for cost reduction (or revenue enhancement)

The Study recommends the following:

- As proposed elsewhere in the Study, longer franchises, and a more flexible business model, should be introduced to incentivise TOCs to make long-term investments related to car parks and gating.
- TOCs at multi-user stations to work collectively with the DfT to ensure that benefits and costs of gating proposals are distributed fairly, and in such a way as to ensure that sound overall business cases are not undermined by the involvement of many parties.
- When transport planning guidelines are next reviewed, consideration should be given to balancing heritage constraints against the need for improved gating options.

8.4.7 Potential for, and timings of, cost savings

Any revenue gains from increased gating would only be derived from individual business cases and the potential varies widely by station, but the Study's analysis suggests that improved gross

revenue benefits, over and above current DfT projections, could be in the region of £25m per annum (this is an estimate, reflecting the modelling referred to earlier in this section, and is based on the assumption that gating is applied to only an additional 10% of journeys, and reduces ticketless travel on these by 4% points). It should be noted that, while Net Present Values for gating schemes are generally very positive, they usually involve significant initial capital expenditure requirements and additional staff.

8.4.8 Implementation plan

The implementation of any measures to improve revenues from stronger TOC incentives/ flexibilities would be through new franchise mechanisms and would be implemented in line with the DfT's franchise timetable.

8.5 Other revenue

8.5.1 Description of studies and analysis

This section looks at the opportunities for the industry to increase revenue from potential revenue sources other than those covered above.

Discussions were held with relevant industry parties and passenger groups, and evidence was sought as to where opportunities exist to improve value for money across the industry.

8.5.2 Evidence base

The primary source of evidence for this area was the stakeholder working group set up to inform the Study's thinking on Revenue issues. The group included representatives of the TOCs, NR, other industry representatives, and Passenger Focus.

8.5.3 Background information and key data

Considering untapped sources of revenue from a cross-industry perspective, the Study has concluded, based on a number of workshops with stakeholder groups, there may be potential benefits in pursuing a wide range of "ancillary" revenue opportunities from such things as platform, on-train and line-side exploitation: national station/train co-ordinated advertising and sponsorship; nationwide station exhibitions/product placement; combined station ticketing and retail facilities (as in the Netherlands); sell-on products such as car hire; and premium package/letter businesses.

8.5.4 Barriers to efficiency

The Study has identified the following barriers:

- **Lack of co-ordinated cross-industry action and leadership constrains the adoption of new ticketing technology**. It may also have an adverse effect on whether co-ordinated activity in relation to advertising and other ancillary revenue opportunities are widely taken up by the industry.
- **The Ticketing and Settlement Agreement (TSA) constrains the opportunities for retail outlets to be located in parts of stations currently taken up by ticket booths** through setting restrictions on ticketing office opening hours and a change process often requiring DfT consent.

8.5.5 Principal issues

Proposals elsewhere in the Study, aimed at giving TOCs and NR stronger incentives to innovate and increase revenues, should further encourage the adoption of innovative ancillary opportunities, as would the creation of a proposed Rail Delivery Group, with responsibility for cross-industry strategies and the dissemination of good practice.

8.5.6 Recommendations for cost reduction (or revenue enhancement)

The Study recommends the following:

- The proposed Rail Delivery Group should identify who should take these concepts forward to ensure that good practice is disseminated, to generate ideas/proposals for innovative products and, where necessary, to engage in national cross-industry engagement with advertisers and sponsors.
- As part of a wider review of the TSA proposed in Section 12, the DfT and the industry should amend the TSA to allow scope for ticket offices to be used for more innovative retail uses (as well as to allow more flexible opening times and staffing levels, and to encourage selective fare discounts for ticket sales by other channels).

8.5.7 Potential for, and timings of, cost savings

The benefits of innovative ancillary activities are hard to quantify in advance with any precision, but some indicative estimates were generated in the stakeholder group as follows:

- Network-wide incentive and loyalty schemes to reward rail travel, e.g. via wider reward schemes (e.g. "Nectar") or a rail loyalty/Smartcard. Rewards could include upgrades, free journeys or discounts via other commercial partners.
- Commercial sales activities on trains and stations.
- Combined ticket and retail facilities could allow additional retail space generating, as well as a saving in staff costs.
- Strategic travel partnerships, e.g. hotel bookings and car hire pick-up from stations.
- The appointment of a single network-wide partner offering short-break holidays (like BR's "Golden Rail"), with discounted travel packages across all rail destinations.
- Premium package and letter business – BR's "Red Star" generated £40m per year turnover. A full revival is unlikely to be feasible, but demand and capacity are thought to exist for a premium station-to-station product which could be based on all TOCs using a recognised parcel and letters courier and secure storage boxes on trains.
- Ticket office space rationalisation at directly managed stations – reductions to this space could release space (up to 50%) for other uses (e.g. retail).

Together such measures might eventually generate in the order of £60m per year.

8.5.8 Implementation plan

Implementation of the above recommendations would be through early action by the parties concerned, either individually or collectively.

9. Area E – Asset management

9.1 Asset management

9.1.1 Description of studies and analysis

This section considers how better asset management can improve value for money in the GB rail industry, what the potential range of cost savings might be and what steps are necessary to deliver them.

The principal piece of work was a study by Atkins into current asset management practice, comparing GB rail with an internationally recognised good practice framework for asset management (PAS 55 – see Box 9.1), and the approach taken by other UK industries and some non-UK railways.

The study followed up the initial Atkins analysis with in-depth analysis of two additional topics: programme management (Section 9.2) and rolling stock (Section 14).

9.1.2 Evidence base

The Study's evidence is based principally on the Atkins report on asset management and the observed gaps between GB rail and best-practice and that of other UK industries and some non-UK railways. The comparator organisations included electricity, highways, defence, and offshore oil and gas. The railway comparators used were primarily the Netherlands and Sweden, but included experience from London Underground, Switzerland and Germany.

To build on these findings, the Study has also drawn on recent reviews and studies and internal analysis, including:

- Asset Management Consulting Limited (AMCL) reports between 2007 and 2010 (independent reporter for the Office of Rail Regulation (ORR) on asset management), in particular their 2009 *Best-practice Review of NR*;
- Infrastructure UK (2010) *Infrastructure Cost Review* (HM Treasury);
- British Standards Institute (2008) *Public Available Specification for the Optimised Management of Physical Assets*;
- Sir Andrew Foster (2010) *Review on the InterCity Express Programme* (Department for Transport (DfT));
- international benchmarking reports of maintenance and renewal costs commissioned by the ORR and Network Rail (NR) between 2006 and 2008;
- a substantial number of submissions from NR describing its current and planned approaches to asset management; and
- Frazer Nash (2011) *T935 – The Case for a Whole-system Approach to Reliability* (Railway Safety and Standards Board)

The Study has reviewed over 20 relevant written submissions and has held meetings and workshops with the Railway Industry Association (RIA) involving a cross-section of its members. Similar workshops were held with the Association of Train Operating Companies (ATOC) Engineering Council and NR, in addition to one-to-one meetings with key suppliers in both the rolling stock and infrastructure supply chain.

Over the course of the review, the Study held nine stakeholder meetings that focused on supply chain and asset management issues. These were attended by clients and suppliers, and they provided a constructive challenge to the Study's work and emerging findings.

9.1.3 Key data

Asset management decisions have a direct bearing on operations, maintenance, renewals and enhancement costs across all parts of the rail industry. In the financial year 2009/10, whole-industry costs totalled £12.7bn. Of this, over half (approximately £7bn) was spent on maintenance, renewals and enhancements.

Asset management is much broader than delivering maintenance or renewals and should be an integral part of how a business operates.

Box 9.1: Good practice for asset management

Good asset management is about ensuring that the whole rail system is able to deliver the required performance at the lowest cost and at an acceptable level of risk. It is about making sure that maintenance and renewals decisions are aligned to business strategy to deliver rail services without compromising health, safety, environmental performance or the industry's reputation. Finally, it is about making sure that the assets will continue to operate effectively and efficiently in the long term.

Best-practice is codified in an internationally recognised framework, PAS 55, published by the British Standards Institute (BSI).

Some of the key information from the Atkins interviews included the following:

- "Overall the Study has found that Government struggles to set the right level of specification, stick by it and see it appropriately delivered through the industry."
- "There was little evidence presented of regular effective cross-industry sharing of information to facilitate better asset management decision-making. Differences of opinion exist as to the reasons for this, but there appears to be adversarial commercial behaviour involved."
- "The Study has seen examples of current initiatives that could lead to better practice within the industry, supported by good asset management vision and senior commitment evolving within NR. These initiatives are, however, being carried out within unsupportive industry constraints, including a range of perverse incentives that are clear barriers to improvement."
- The Independent Reporter has stated (AMCL, 2009) that evidence from other organisations shows application of risk-based maintenance can deliver up to 30% reductions in maintenance expenditure with no increase in risk."

A further practical example of the possible cost savings through better asset management is demonstrated by one Train Operating Company (TOC) which commissioned an asset management consultant to reduce its station maintenance costs for a portfolio of 160 stations. Over five years

the TOC made £8m of savings. This was achieved through improving its asset knowledge and therefore being better able to plan, specify, package and procure its station maintenance. Another example from Switzerland is summarised in Box 9.2.

Box 9.2: Asset management reducing unit costs

SBB, Switzerland, achieved a 20–25% reduction in unit costs as a result of implementing an integrated asset information management system.

This included an asset register supported by an interlinked structure of asset-specific files, giving access to as-built drawings, equipment configuration details, track and overhead line longitudinal positioning in space, and component records. A noted success factor was that asset and project managers were made personally accountable for the absolute accuracy of the drawings and data loaded onto the system progressively over several years. All track maintenance work uses machinery controlled by the system's software files to restore track position.

9.1.4 Barriers to efficiency

Although there are examples of good practice asset management within GB rail, the Study's analysis indicates that, overall, GB rail still lags behind best-practice asset management. Specifically:

- there are misaligned objectives and incentives due to the different business models of Rolling Stock Companies (ROSCOs), TOCs and NR. For example, removal of a disused siding could reduce industry costs, but it is not in a train operator's interests to agree the necessary Network Change, even if the operator has no foreseeable use of the asset;
- there are misaligned and short-term financial forecasting and planning cycles. For example, the ROSCOs' interests are to manage the rolling stock to lowest whole-life cost over the asset life, typically 40 years. However, the franchisee is only interested in short-term cost minimisation within its franchise period, potentially driving up whole-life costs by not doing the appropriate maintenance at the optimum time. This is further complicated by the DfT being, at times, unclear about, or unwilling to share, the long-term rolling stock deployment plan and its relationship to the franchising process;
- poor use of, and capability of, asset information systems means that, in places, it is very difficult, if not impossible, to make cost-effective asset management decisions on a whole-life cost basis. This is compounded by IT in industry or departmental silos and poor take-up of predictive models (especially at the whole-system and strategic levels);
- trade-offs across the industry are extremely difficult, hindering whole-system management. For example, changes to train characteristics on a particular route might reduce the infrastructure maintenance costs, but require bespoke and time-consuming arrangements between industry parties. These are often difficult to agree due to the risks and benefits falling unequally to different parties who may also have different contracting horizons;
- poor transparency of costs, revenue and performance risks hinders the efficient operation and maintenance of individual assets and portfolios of assets;
- there is only piecemeal take-up of modern asset management approaches, such as risk-based maintenance or lean/agile engineering;

- risk understanding and management is poor, with unclear accountability, poor allocation of risk and poor delegation by managers who are not always confident at making risk-based decisions, or who do not have the necessary tools and information to make them;
- there is a general lack of people with whole-system expertise, particularly in middle to senior management positions. Consequently, there is a lack of appreciation of the impact on costs and performance of major asset-related decisions; and
- there is no whole-system asset management review and audit process in place to drive continuous improvement.

9.1.5 Principal issues

The principal issues that the Study has sought to address are detailed as follows:

- How to ensure a clear "line of sight" from industry objectives down to individual asset decisions. As discussed in Section 5, there are weaknesses in how whole-rail objectives are set, and the objectives for train operations and infrastructure management are generally too detailed, and pass down different organisational silos. In addition, new objectives are injected at lower levels. The focus on specifying detailed inputs or outputs, rather than transport outcomes, makes it hard to identify lower cost asset management approaches.
- How to get appropriate and accessible asset information that enables timely and cost-effective decision-making at all levels of industry.
- How to ensure cost-effective trade-offs between rolling stock, infrastructure and operational requirements at and below the DfT level. Even where these trade-offs do occur, they are difficult to make due to the absence of good information and holistic models that are supported by consistent trade-off criteria.
- How to establish long-term financial forecasting and planning to encourage investment in new technologies and approaches with higher upfront cost, but lower whole-life costs.
- How to grow a whole-system asset management capability in GB rail in terms of people, processes and culture – an example of the benefits of good asset management is found in Scottish Power, as explained in the box below.

Box 9.3: An example of an asset management framework developed by Scottish Power Energy Wholesale

In 2006, Scottish Power identified the need for a strategic improvement in asset management. Scottish Power operates a range of assets including coal, oil, gas, hydro and renewable generators. Over three years they spent £5.2M to transform their approach to asset management.

Key enablers included:

- The establishment of clear organisational objectives, based around '6 big goals';
- The establishment of a more consistent approach to maintenance, based upon multi-disciplinary groups;
- The use of maintenance optimisation approaches, moving from 5% of maintenance being preventative to 70%;
- Introduction of new asset information systems, based upon 'off the shelf' technology with minimal tailoring;
- Close alignment between asset and supply chain management, with engineering and procurement working to common objectives;
- Partnering with business critical partners; and
- An inclusive implementation approach that focused on culture and behaviours as well as structures and processes.

The approach has been highly successful, with a 20% reduction in operations and maintenance, 22% increase in plant availability, 25% reduction in plant forced outage rates and a 10% reduction in capital expenditure.

- How to align authority, responsibility and accountability across the industry.
- How to establish locally optimised decision-making that reflects local needs and improves the integrated route-level planning between infrastructure and train service planners. The difficulty of balancing engineering costs of maintenance and renewals with operational costs and revenues is illustrated in Box 9.4.

Box 9.4: Difficulty of infrastructure and operational trade-offs

Maintenance and inspection of rail infrastructure is normally done through overnight and weekend "possessions" where track maintainers get access to the track between the last evening train and the first train the next morning.

Owing to the hazards of working on the infrastructure at night, and possibly in poor weather, access to the track is a complex and safety critical task. Taking possession of the track and giving it back can take between one to two hours off the effective working time. This means that on most nights NR only has two to four hours on the busiest sections of the network to undertake maintenance. Implementing quicker ways to take and relinquish possessions will increase the time available for engineering work.

A secondary issue is the financial and reputational impact of possession overruns, which can be significant for the industry.

NR has responded to these risks by adopting conservative planning assumptions and the costly use of contingency plant and labour to reduce the likelihood of the possession overrunning, yet the real impact of an overrun may often be less serious than the financial costs associated with minimising the risk. For example, early services are rarely heavily loaded and, if the TOC can locally plan ahead in co-operation with NR, the impact of an overrun can be mitigated with replacement bus or taxi services (see Section 18 for further information).

The impact of this conservative planning is that maintenance is done in very short bursts, which is often significantly more expensive than undertaking the maintenance in a single longer possession, although this can be disruptive for passengers and freight operators. This cost is often disproportionally high compared with the service value of the first or last train.

Although current industry processes allow for NR and TOCs to negotiate access times for engineering work, the process is convoluted and does not always lead to the best value outcomes. NR has to compensate TOCs for any disruption to their service.

This means that overall costs are higher than they need to be because the legal and contractual framework does not support flexible local trade-offs. NR and train operators need to develop more flexible ways of running trains while engineering work is being undertaken, e.g. the use of "single line working" and bi-directional signalling.

9.1.6 Recommendations for cost reduction

To enable significant cost reductions in asset management, the Study recommends that the industry embraces the following proposals:

- Create suitably incentivised and empowered route-level organisations that are accountable for delivering defined transport services within a defined budget and that have the incentives and authority to optimise costs and revenue across rolling stock, operations and infrastructure. This will be achieved by the closer working between the TOC and infrastructure provider, as discussed in Section 7 and summarised below:
  - in vertically-separated railways, the benefits will come through better collaboration and cost-revenue sharing between the infrastructure manager and train operators – there should be co-located teams to ensure the development and implementation of joint asset management policy, strategy and planning; and

  - if/when parts of the industry become vertically-integrated the structures and incentives will drive good asset management, but there needs to be a control mechanism to ensure that the Vertical Integration (VI) concession holder cannot degrade asset quality below optimum levels.

- Develop a high-level framework for asset management. This framework will include the mechanism for translating the high-level Government policy and objectives for GB rail into route-level targets; a 'light-touch' asset management framework for the route-level organisations; a set of simple decision-making criteria to allow consistent and cost-effective trade-offs between cost, risk and performance and a whole-industry asset information strategy (including the definition of relevant information standards).
- Create a centre of excellence in asset management that will collate the core route-level (whole-system) asset information; work with the route-level organisations to help them implement best practice asset information management; and accelerate the adoption of good practice asset management approaches. This should initially be based around current NR central asset management functions.
- The new route level asset management organisations should make the necessary investments in improved asset information management, including significant investments in new asset information systems, condition monitoring systems, asset surveys and asset failure analysis.

It would be the responsibility of the RDG, working with the Change Team, to assign responsibilities for these actions. To deliver the significant cost reductions, the industry should implement the approaches and actions such as are outlined in Box 9.5.

Box 9.5 An asset management framework for the GB rail industry

Implement appropriate (and locally optimised) maintenance regimes

Better asset condition monitoring, coupled with a better understanding of asset failure modes and their criticality, can enable the adoption of more cost effective approaches. A move away from calendar based maintenance and renewals can avoid the cost of unnecessary work. Non-critical assets will be fixed when they fail, and critical assets fixed when their condition begins to deteriorate. For example, train based video detection of loose bolts could reduce the need for line-side inspections, enabling maintenance teams to focus on fixing specific problems. This could reduce inspections and the amount of maintenance done, reducing maintenance staff, equipment and contract effort.

Improved balance of maintenance and renewals

Better asset information, coupled with longer financial planning horizons and a clear asset management framework can enable individual asset replacement and maintenance policies to be optimised for specific assets. This will reduce renewals costs (and associated staffing, materials and contractor costs) as fewer assets would be replaced before the end of their life.

Greater diversity of asset policies across the network

Local delegation of decision making, coupled with better understanding of asset condition and criticality, could enable asset managers to adopt cheaper maintenance approaches, e.g. those applicable to the lower-cost regional railway. This could reduce renewals and maintenance costs either through cheaper unit costs or increased time between maintenance.

Flexible trade-offs between revenues, renewals and maintenance costs

A contractually binding commitment to share costs and revenues could ensure that TOC and IM optimise the loss of revenue due to possessions against maintenance and renewals costs. This could reduce the number of contractor and IM staff required as possessions becomes more productive, more focused and less intensive.

Eliminate activities that add no value to customers ('lean engineering')

A greater focus on cost reduction, coupled with simpler objectives and more long term collaborative relationships can encourage the adoption of joint improvement initiatives to address issues such as the time to take up a possession. This could reduce direct and overhead costs by identifying and removing activities that do not add value.

Agile decision making

Competent decision makers would be able to use their delegated authority within the framework to quickly make the right decision on the ground. This could increase the period between maintenance as less time needs to be factored in to cope with decision delays, enabling a reduction in staffing and materials.

Sharing of practice and information across all of GB rail

Working within a national framework could enable the above improvements, and ensure that key information is shared across GB rail. It could also ensure that those who have to work with multiple routes do not see increases in their overheads through the research and retention of duplicated information.

9.1.7 Potential for, and timings of, cost savings

Initial estimates for the savings that can be achieved, based upon Atkins' and Arup's work, are shown in Figures 9.1 and 9.2. Overall, better asset management, together with better supply chain management, can achieve savings of between **£168m and £425m operating costs (opex)**, and **£287m and £722m capital costs (capex)**, per annum by 2018/19. These estimates have a wide range because of the difficulty in predicting, at this stage, the eventual shape of the new structures and incentives.

Figure 9.1: NR and TOC opex savings estimates

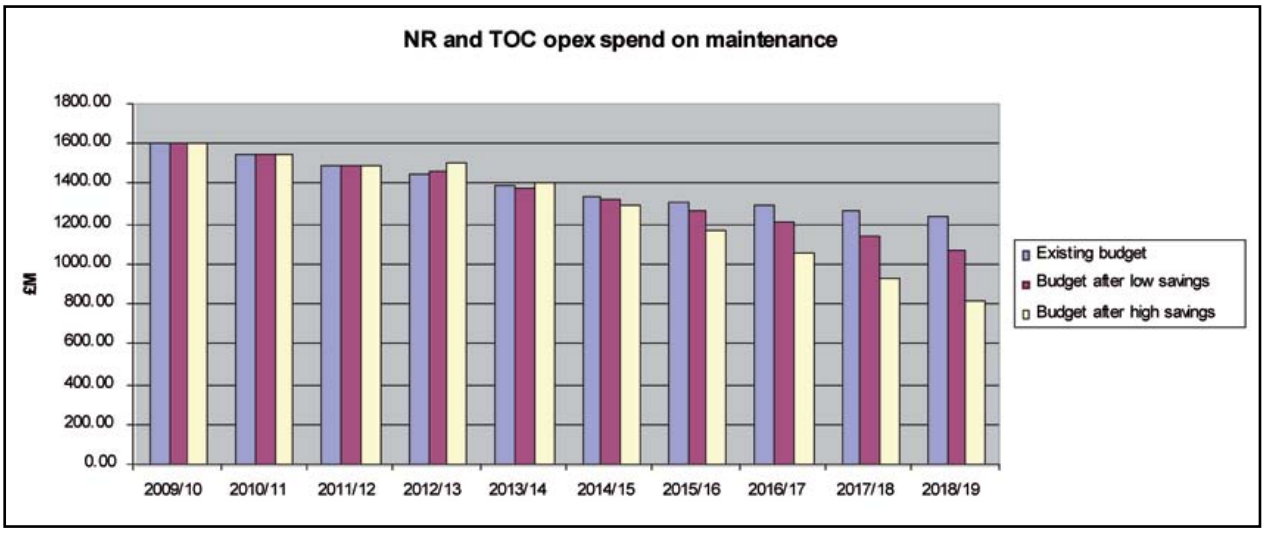
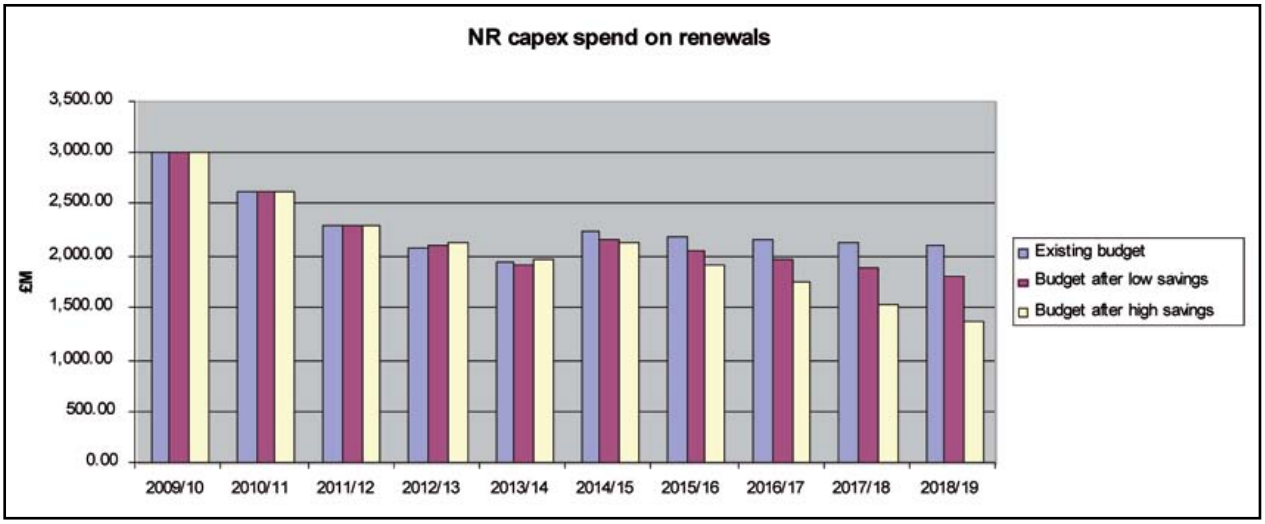


Figure 9.2: NR capex savings estimates



In order to achieve these savings, an estimated £250m will need to be spent on improving the capability of local and central asset information systems, including field surveys, condition monitoring systems, failure mode analysis, decision support tools, the training of field and office staff, and a small central IT solution that is capable of collating the information that is collected by the routes.

The cost benefits of improved asset management generally come from:

- cutting unnecessary or non-value adding work (inspection, maintenance or renewal/upgrade); and
- focusing on the minimum work needed to deliver performance objectives – this means ensuring that only the right work is done, at the right time and to the right specification.

It is difficult to separate the asset and supply chain management savings as they are strongly interconnected. As asset management reduces the work volumes necessary, the addressable costs for supply chain reductions decreases. However, better supply chain practices, especially increased collaboration, often enables radically cheaper asset management practices.

This means that the benchmarks used to calculate the potential savings are for both asset and supply chain management.

The earlier the alignment of operator/infrastructure incentives can be put in place, the faster the savings can accrue. The widespread adoption of partnering and alliances across the industry also will deliver significant cost reductions.

9.1.8 Implementation plan

As in other areas, the change management leadership group needs to ensure that the changes take place in order to deliver the asset management benefits.

This will include establishing a **suitably qualified and experienced implementation team** with a detailed implementation plan that includes both short- and longer-term activities.

Early implementation initiatives to complete within the next 12 months include:

- establishing an asset management education programme for key railway staff, including a leadership development scheme to develop the next generation of rail engineering leaders as whole-system asset managers, targeted at the routes that will become the early adopters;
- further developing the "light touch" asset management framework that defines the level of freedom that route-level organisations will have, while safeguarding against short-term cost cutting at the expense of longer-term cost shocks;
- the development of an industry-wide asset information strategy to map out how information will be collected, evaluated, collated, analysed, used and communicated in the new industry organisation; and
- challenging existing industry groups (ATOC, RIA and NR) to respond with proposals that will deliver early benefits.

It is important that these activities are started quickly in order to accelerate the long lead times that are necessary to change behaviours and skills.

The longer-term implementation plan will need to be aligned with the organisational and strategic changes recommended elsewhere in this report, particularly the new industry structure and financial forecasting and planning processes.

It will be necessary to:

- ensure that the new industry structure both supports the adoption of whole-systems asset management and includes the right incentives, targets and recommendations as highlighted in this report;
- establish new industry-wide financial forecasting and planning processes; and
- ensure that the implementation plan can clearly demonstrate how the new structure is going to deliver the asset management benefits.

9.2 Whole-system programme management

9.2.1 Description of studies and analysis

This section considers how to improve value for money by better programme management of major enhancement schemes in the GB rail industry. It estimates what the potential range of cost savings might be and what steps are necessary to deliver them.

The principal piece of work was a high-level analysis of the current state of programme management in GB rail compared with best-practice frameworks. This work was supported by a consultation with a wide range of industry representatives to discuss the potential for improvement and the barriers to reducing costs and the risk of cost overruns.

9.2.2 Evidence base

The Study's assessment is based principally on the Atkins review of GB rail whole-system programme management, completed in February 2011, which built on their earlier work on rail's asset management and supply chain management assessment. This earlier work indicated that GB rail programme management was well short of best-practice and, given the significant ongoing investment in GB rail, and the deficiencies in the current GB approach, there were significant opportunities to improve value for money.

Atkins' reports are based on evidence from over 130 interviews with senior industry figures, as well as an in-depth review of recognised best-practice frameworks and how they can be applied to best effect to GB rail. The Study's evidence also includes a substantial number of reports commissioned by industry and wider government in the last 10 years. Principally these include:

- The Office of Government Commerce (2007) *Managing Successful Programmes*;
- Infrastructure UK (2010) *Infrastructure Cost Review* (HM Treasury);
- Royal Academy of Engineering (2007) *Creating Systems that Work*;
- Bernard Gray (2009) *Report on MOD Procurement*;
- The International Council (2009) *System Engineering: Z1-Guide on What is Systems Engineering*;
- Frazer Nash (2011) *T935 – The Case for a Whole-system Approach to Reliability* (RSSB);
- Sir Andrew Foster (2010) *Review of the InterCity Express Programme* (DfT); and
- Civity (2010) *International Benchmarking*.

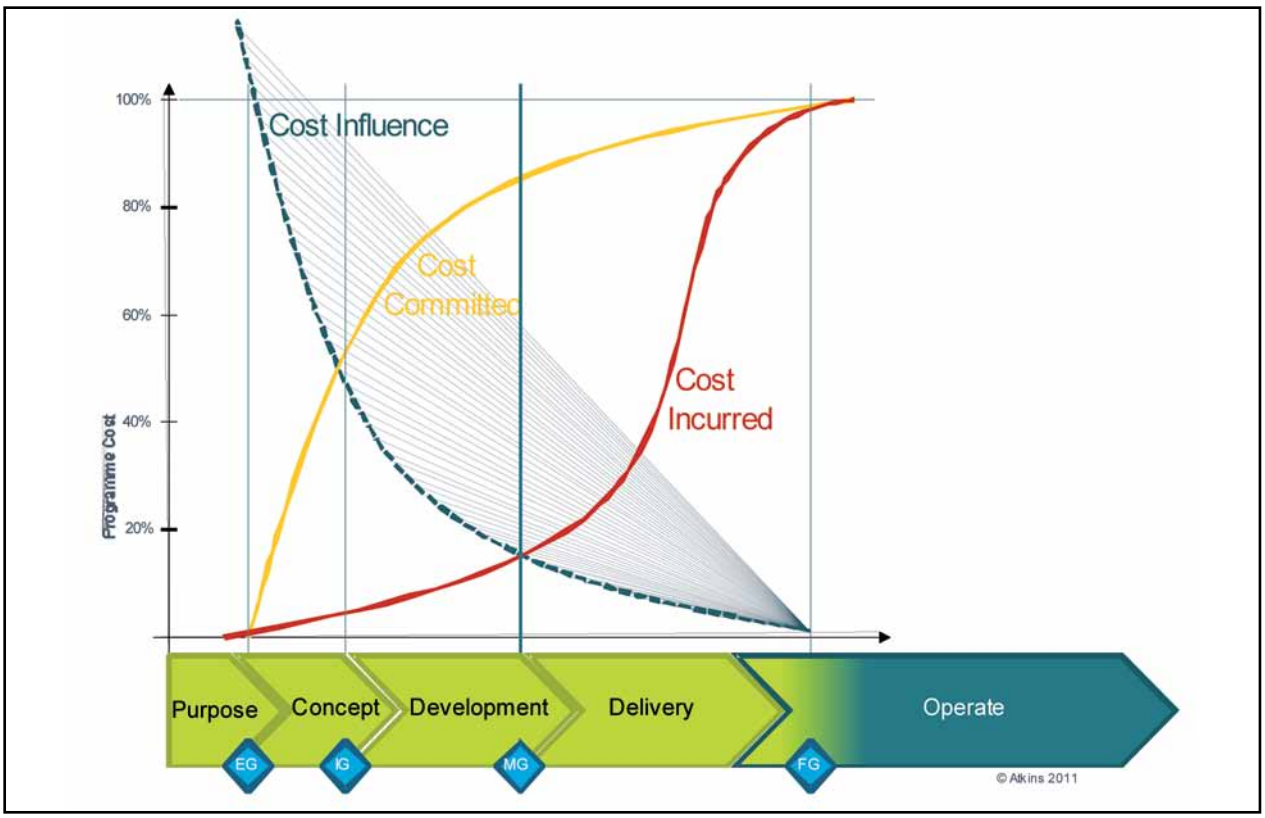
Over the course of the review the Study held nine stakeholder meetings that considered the Study's findings on major rail enhancements. These were attended by both clients and suppliers, and provided a constructive challenge to the Study's work and emerging findings.

9.2.3 Key data

Background information on whole-system programme management

A critical success factor for major programmes is to get the early concept and initial designs right. Figure 9.3 shows that typically by the time the project has spent 15% of its budget, it has committed over 80% of its costs. For example, by the time a typical enhancement project has been awarded to a main contractor to do the detailed design and build, almost all of the opportunity to reduce costs through innovation has been lost.

Figure 9.3: Cost influence, commitment and spend against programme phases



It is also important to put sufficient effort on whole-system design assurance, for example progressively prototyping, modelling or testing the final system to make sure the expected benefits will be delivered.

The financial issues in this area of GB rail are significant. The forecast capital spend on rail enhancement schemes in GB rail is likely to increase to between £2bn and £3bn per annum on average over the next 20 years. This is derived from an assessment of existing committed programmes such as Thameslink, Crossrail, High Speed 2, electrification and allowing for a level of ongoing smaller capacity enhancements and rolling stock replacement.

Programme cost overruns

In recent years there have been several high profile examples of major enhancement schemes that have encountered significant cost overruns and suffered severe delays. Notably the modernisation of the West Coast Mainline was initially funded at less than £3bn in the late 1990s, but the out-turn costs were £9bn for a reduced output (e.g. line speed of 125mph rather than 140mph). The Thameslink programme in 2003 was funded at £2.7bn, and is now forecast to cost £5.5bn, with

completion planned for 2018. The GSM-R cab fitment was initially funded for £117m in 2003, and is now forecast to cost £196m.

Halcrow[51] found that the average cost overrun from initial output definition to programme completion was 67% for NR enhancements. As a comparator, Bernard Gray's report on defence procurement noted that the MOD's adoption of Smart Acquisition reduced the average overspend from 54% to 25%.

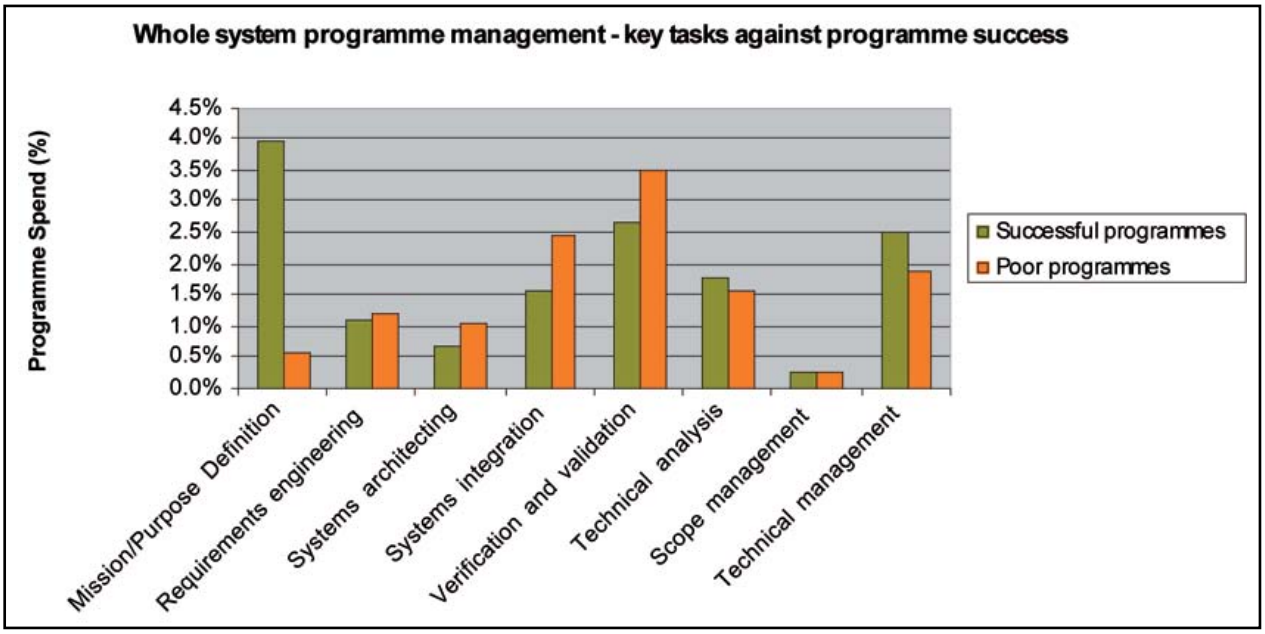
Major programmes are especially problematic as issues often only surface as wider system problems at the end of the programme. For example, to enable the very high passenger flows through Thameslink stations, an improved customer information system was specified to help minimise dwell time. This was initially de-scoped as a cost saving measure, which would have meant that the passenger through-puts would not have been delivered.

Although these high levels of cost overrun are not measured against a committed budget (the budget is not committed until a firmer design is completed), this nonetheless indicates that GB rail's capability to quantify up-front cost and risk against benefits up front is below par compared with other industries.

This is supported by NR's recent review of its project management processes, where it has sought to re-balance its resources over a project's lifecycle to ensure that more effort and rigour is invested earlier on so that the best value design is commissioned and to reduce the risk of re-work in later stages.

Further evidence is illustrated in Figure 9.4 which is from an international benchmarking of whole-systems programme management across multiple sectors, undertaken by Honourcode Inc. It shows the relationship between the effort spent on various whole-system programme management tasks and the programme's eventual success. This shows a very significant correlation between clear mission/purpose definition and programme success.

Figure 9.4: Relative spend against key tasks and programme success



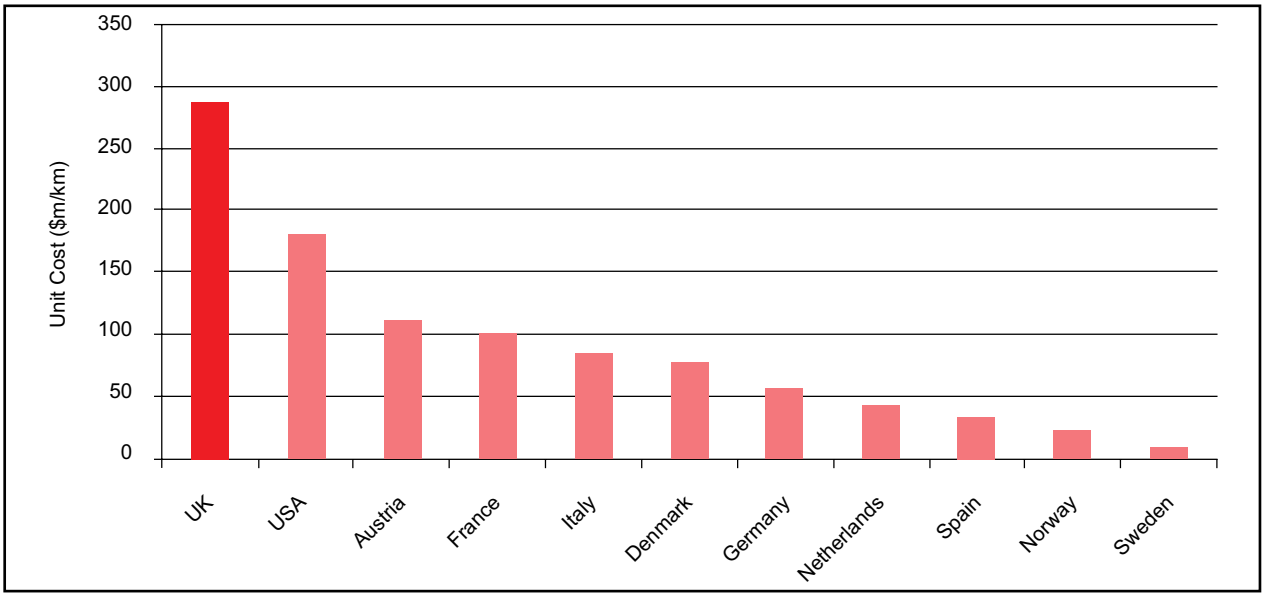
51 Halcrow (2010) *Updated Optimism Bias Study.* London: DfT.

The importance of this early definition is especially marked for complex whole-system transport programmes, where there are greater risks and opportunities at stake. There is currently a lack of the right models and tools that need to be deployed to support this stage of concept development. The result of getting this wrong is a risk that poor value rail programmes progress at the expense of better value alternatives.

Unit costs

The Atkins report found that the GB performance in delivering enhancements schemes could be significantly improved. This was supported by the broader cost benchmarking by Infrastructure UK (IUK) of civil engineering costs, which concluded that there was an efficiency gap of at least 15% for UK infrastructure projects with the rail sector as no exception. Figure 9.5 is drawn from the IUK report and shows that UK rail infrastructure costs are significantly more expensive than comparators in the US or other European countries.

Figure 9.5: Normalised unit costs for rail projects in the EU and USA (EIB/IUK)



There are also some examples that indicate that NR's unit costs for small enhancement projects are higher than when a TOC delivers the same type of work. In 2010, the ORR reporter worked with TOCs and NR to attempt to benchmark station improvement work. Although the sample of TOC schemes was too small to draw definitive conclusions, the comparable examples showed that, on average, TOCs spent 15% less on overheads than NR, and unit costs for installing customer information screens seemed to be roughly half when delivered by TOCs.

9.2.4 Barriers to efficiency

- Whole-system thinking is not applied consistently on major cross-industry enhancement programmes. This is critical to ensure that investment in major programmes delivers value for money, both in terms of the solution that they deliver and the cost of delivery. In the current industry structure, it is not unusual to find that different elements of a complex multi-billion pound enhancement programme are being delivered, funded and governed separately, with the attendant interface risks between rolling stock, infrastructure and operations not well defined or managed.

- There is at times poor allocation of authority, responsibility and accountability across the industry, making it very difficult to manage the programme over its lifecycle and deliver value for money. As a result, benefits from the investment are sub-optimal and opportunities to achieve best value for money are missed as teams are constrained by having only partial responsibility and authority. A major programme needs to be conceived, planned, designed and delivered in an integrated way in order to avoid poor value solutions, misaligned deliverables, nugatory work, and schedule and cost overruns.
- There is a blurred line between funder, client, sponsor and delivery agent once the funding is passed down to different industry parties. Often authority is vested in one organisation, with benefits to other organisations being lost. Programmes are not distinguishing clearly enough between: stakeholders who are funding an enhancement, those who will benefit from the programme, those who are delivering parts of the programme, and vocal individuals with an interest in trains. As a result there is a lack of clarity between accountability for deciding what needs to be done, for designing the solution and for delivering it.
- There are weak incentives to cut whole-system costs or come up with best value solutions.
- There is a general lack of broader good practice in programme management and often a lack of awareness of what good practice is. In particular, there is a strong focus on projects rather than programmes, causing a failure across the industry to properly differentiate between a project that delivers discrete outputs (e.g. platform lengthening between Waterloo and Woking) and a programme that delivers transport outcomes (e.g. enhanced passenger carrying capacity between Waterloo and Woking, through co-ordinated projects such as longer platforms, longer trains, a revised timetable, signalling and power supply changes). Even where this understanding exists, there are few examples where best-practice approaches have been adopted to integrate the projects formally into programmes.
- Also evident is a tendency to commit to one particular solution far too quickly and long before it has really been tested against other options. This can severely restrict the opportunity to develop better value solutions (both technical and commercial) that may well deliver most or all of the enhancement benefits. For example, a route-wide platform lengthening project might not be necessary at all stations if the train operator can operate "selective door operation" at less busy stations.
- There is insufficient recognition of the different maturity of programmes that are packaged into five-yearly control periods. The funding commitments do not explicitly differentiate between those programmes that are still in early development, with only outline concept design, and those that are sufficiently developed to justify full funding.
- There is insufficient focus in the early stages of a programme, for example: to ensure that a range of alternative solutions are properly considered; to ensure that there is clear traceability from sub-system requirements, through the scheme design to desired benefits; and to ensure that major risks are understood and quantified. To compound this problem there is generally poor alignment between the solutions and the benefits, which need to be clearly articulated and managed throughout the programme lifecycle.
- Contestability is low and programme elements that could probably be better delivered by a third party or procured as a service are often designed and delivered in-house. There is a widely held, but often incorrect, view that client, sponsor, designer and deliverer should be part of the same organisation.

Overall, these barriers combine to result in a lack of focus on delivering the best value for money transport enhancements at the lowest whole-life cost.

9.2.5 Principal issues

The principal issues in this section closely align with the IUK findings (Section 10.2). The range of barriers can be distilled into the following principal issues:

- How to ensure that GB rail follows a universal 'best practice' governance process throughout the lifecycle of major cross-industry programmes. There is currently patchy application of good practice across the programmes the Study reviewed. Also, although there is a standard investment governance process for infrastructure projects (NR's GRIP process), there is not a standard governance process for cross-industry programmes.
- How to ensure the planning and regulatory funding cycles properly distinguish between programmes at different development stages to avoid committing control period funds for major programmes too early or too late.
- How to ensure that major rail programmes are considered holistically, from the concept stage right through to final commissioning by an integrated programme team. Currently, this is not normally done, with major programmes being managed through diverse programme teams, where the whole scheme only comes together at the DfT level or a high-level Programme or Sponsor's board. Even where teams are nominally integrated, there are significant examples of "man marking" with low levels of trust between customers, clients and suppliers.
- How to ensure that programmes have a clear purpose and evaluate alternative ways for meeting that purpose before a solution is fully developed. The purpose should be solution neutral and focused on delivering transport outcomes (such as increasing passenger capacity by 20,000) rather than elements of the solution (such as a certain number of trains or even train seats per hour).
- How to ensure technical design assurance is improved by moving away from using traditional design codes, standards and man-marking/peer review to one which seeks to ensure that the different projects, sub-projects and components deliver the minimum necessary to meet the programme's purpose. The process needs to provide stakeholders, regulators and Government with much better transparency and confidence of successful delivery.
- How to ensure that stakeholder management is improved so that stakeholders are involved and "buy-in" at the right time during the programme lifecycle, and equally that they are disengaged when their part is complete. This should ensure that what is completed at each stage is fit for purpose for the next stage and avoids a process of parallel working and undue interference.
- How to implement the new programme management approach in legacy programmes while causing the minimum disruption to programme delivery. This is important as the benefits achievable decrease as programmes progress. Early action will both increase the level and timing of benefits.

9.2.6 Recommendations for cost reduction

Nearly every rail programme addresses some of the issues above, but the Study was unable to find a programme that currently addressed all of them. The Atkins study concluded that a failure in any one of these areas could lead to poor value for money in programme delivery.

The Study therefore recommends that **a best-practice framework** is developed for major whole-system programmes in GB rail, building on the current examples of good practice in GB rail and elsewhere. This should set out a consistent whole-industry approach. This needs to fit with wider Treasury and Cabinet Office criteria for major investment programmes. The framework should:

- ensure clearer roles and responsibilities for client, sponsor, funder and delivery partners, supported by better stakeholder management throughout the programme's lifecycle;
- ensure a Sponsor's Board is established that owns the statement of the problem that is being solved. The board should include senior representatives from all the organisations that need to deliver change in order to achieve the outcomes. The board will hold the integrated programme team to account for delivering these outcomes;
- ensure empowered integrated programme teams are formed of representatives from the delivery organisations – the teams need to have authority over the required rolling stock, infrastructure and operational aspects of the programme;
- establish a standard programme governance process that ensures that the programme has a clear purpose, has evaluated a range of solutions, has a clear understanding of all of the costs and risks associated with delivering the programme's benefits, and, finally, that it delivers what is required – the process should ensure that programmes proceed to the next phase only when they meet specified criteria;
- ensure a clear programme assurance strategy and detailed assurance approach that progressively demonstrates that the programme is on course to deliver the benefits; and
- implement this in existing programmes, through modifying the current stage gate review process to reflect the new requirements. For those programmes that are well developed or in the delivery phase there will need to be pragmatic assessment of the benefits of fully applying the best-practice requirements. For new programmes, the best-practice framework can be applied in its entirety, and should deliver by far the greater cost benefits.

These recommendations can be implemented through changes to industry processes rather than changes to industry structure, with the benefits largely coming from existing and new programme organisations progressively moving towards a best-practice approach.

Responsibility for ensuring that this best-practice framework is developed and applied should be assigned to a small group of people from the principal organisations involved (principally NR and the DfT), facilitated by the Change Team. In addition, the industry needs to develop mechanisms to better manage the portfolio of programmes and the interactions between programmes. Box 9.6 shows an example of the benefits of a more integrated approach.

Box 9.6: An example of the benefits of a more integrated approach – Thameslink

In early 2009, the Thameslink programme recognised that it had no effective strategy for systems integration to ensure that the rolling stock and infrastructure could deliver an effective transport service. The programme faced a series of difficult technical and scheduling challenges. These included introducing new operational concepts and technology, such as in-cab signalling, automatic train operation and new rolling stock.

This programme established a multi-discipline, multi-stakeholder Systems Integrator (SI), responsible for ensuring that the system design reliably delivers the transport benefits that its funders expect.

Key to the System Integrator's success has been the development of a clear 'route map to success' that shows how the new technologies will be progressively integrated to deliver the required throughput.

The SI has delivered significant benefits to date, for example by modelling and communicating to stakeholders how Thameslink will operate, it has identified and designed-out non-value adding requirements and mitigated many problems.

However, the SI was only established in September 2009, well after the requirements (and costs) for the major rolling stock and infrastructure elements were fixed, and so it has not been able to examine radically different options.

9.2.7 Potential for, and timings of, cost savings

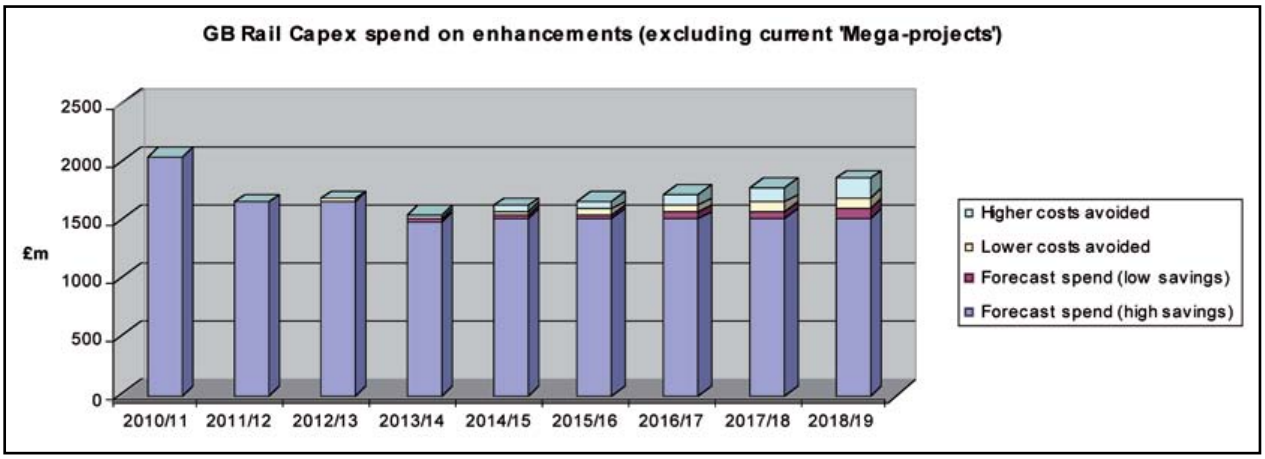
Overall, the Study believes that savings can be achieved through:

- reduced engineering costs, as subsystems are not over-engineered, instead being designed to meet the need, not the legacy standard;
- reduce programme management costs, as better design assurance and commercial approaches can reduce the levels of "man marking";
- reduced rework, with fewer issues at commissioning leading to additional (and expensive) corrections;
- better initial option selection, with a small number of projects expected to identify significantly cheaper solutions and most projects expected to see more effective approaches;
- faster programme implementation during the expensive later phases, reducing overheads and delivery staff costs; and
- increased focus on delivering transport outcomes.

Such approaches are estimated to be able to save between 6% and 18% of enhancement spend and help to avoid 17–30% of associated overspends.

This translates to an initial estimate ranging from £66m to £233m per annum of cost savings, and between £91m and £161m per annum of costs avoided by the end of the financial year 2018/19, based on the estimated programme workload as shown in Figure 9.6.

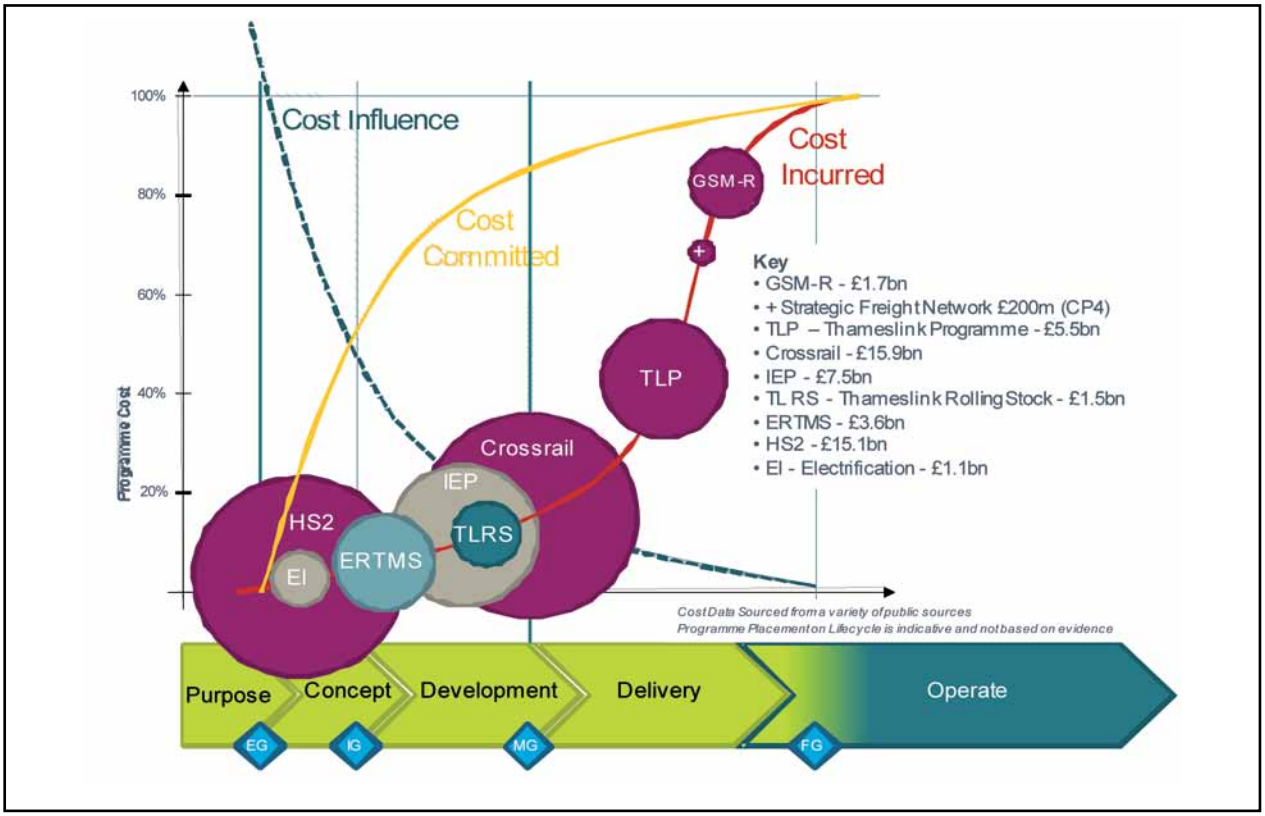
Figure 9.6: Capex savings estimates



The wide range of the estimate is due to the level of whole-system programme management already in place in specific programmes and uncertainty whether the new approaches can be embedded in time to influence key decisions, as illustrated in Figure 9.7.

The exact savings achievable will need to be determined by working closely with the current rail programmes, identifying where they are falling short of good programme management practice and putting in place clear improvement plans.

Figure 9.7: The relationship between programme phase and level of benefit achievable



9.2.8 Implementation plan

This will initially require establishing a **suitably qualified and experienced implementation team** with a detailed implementation plan that includes both short- and longer-term activities.

Early implementation initiatives should all be complete within the next 12 months and should include:

- implementing the new planning approach in time to ensure that the enhancements planned in High Level Output Specification 2 (HLOS2) for Control Period 5 (CP5) are specified as whole-system, whole-life approaches;
- developing the whole-system development approach discussed in Section 9.2 in sufficient detail to ensure that it can be easily implemented by new programmes;
- incorporating the new approach in the existing assurance regimes, particularly the investment stage gate reviews, to ensure that existing programmes are adopting appropriate good practice;
- determining whether the current appraisal processes, models and tools need to be changed to support the new approach;
- determining whether there are any training or development needs to support the new approach and, if so, determining the best way to fill them; and
- supporting major programmes in assessing whether they could reduce costs or risks by adopting elements of the new approach.

The main effort should, however, be focused on ensuring that new programmes adopt the new approach and focus on delivering the lowest cost solution to delivering transport outcomes.

The implementation of the new approach will also be an opportunity to act as a pathfinder for the wider IUK programme management approaches.

10. Area F – Supply chain management

10.1 Supply chain management

10.1.1 Description of studies and analysis

This section considers how to improve value for money by better supply chain management in the GB rail industry. It estimates what the potential range of cost savings might be and what steps are necessary to deliver them.

Supply chain management encompasses the planning and management of all activities involved in buying goods and services. Importantly, it also includes co-ordination and collaboration with partners, who can be suppliers, third-party service providers, or customers.

The principal piece of work involved a study by Atkins of both supply chain management and asset management in GB rail as outlined in Section 9 and this Section. In addition, the Study commissioned Arup to look at rolling stock provision in GB rail, including related supply chain management issues.

10.1.2 Evidence base

The Study's assessment is based principally on the Atkins report on asset and supply chain management in GB rail, which included a high-level assessment of current GB rail practice compared with supply chain management good practice (see Box 10.1). The GB rail approach was compared with that taken by other UK industries and some non-UK railways. Common with the asset management review, the UK industries included electricity, highways, defence, and offshore oil and gas. The railway comparators used were primarily the Netherlands and Sweden, but included experience from London Underground, Switzerland and Germany.

To corroborate the findings, the Study has also drawn on recent reviews and studies and its own analysis. Principally these include:

- Department for Transport and Department for Business, Innovation and Skills (2009) *The UK Rail Supply Chain*;
- Arup (2011) *Whole Life Costs of Rolling Stock*;
- British Standards Institute (2010) *BS 11000: Collaborative Business Relationships*;
- *High Speed 2: Command Paper* (2010);
- AT Kearney, Review of NR Procurement in 2007 and 2010; and
- the Competition Commission's review of rolling stock markets in GB reports between 2007 and 2009.

The Study has reviewed over 20 industry submissions and held meetings and workshops with the Railway Industry Association (RIA) involving a cross-section of its members, in addition to focused

workshops with the Association of Train Operating Companies (ATOC) Engineering Council, Network Rail (NR) and one-to-one meetings with key suppliers in both the rolling stock and infrastructure supply chain.

The Study also held nine stakeholder meetings that focused on supply chain and asset management issues. These were attended by clients and suppliers, and provided a constructive challenge to the Study's work and emerging findings.

Box 10.1: Supply chain management good practice

Good supply chain management is about optimising the value delivered to customers against the costs incurred by suppliers in a way that is sustainable. It requires:

- the development of a clear and consistent supply chain strategy in collaboration with key suppliers;
- the use of appropriate contracting frameworks, ranging from highly-competitive, market-oriented approaches to highly-collaborative partnering;
- visibility of future demand to allow suppliers to plan ahead and identify potential problems and opportunities;
- understanding the cost of the whole procurement process (the cost-to-serve) for each activity to allow sound make-or-buy decisions;
- utilising strategic partnerships along the supply chain to align customer requirements with service and infrastructure delivery; and
- providing incentives to stimulate continuous improvement in outputs through long-term strategic alliances, particularly where the market is weak or criticality is high.

10.1.3 Key data

Overall, the evidence from the Atkins findings, the interviews and workshops all strongly indicated that the industry's supply chain was not operating in a cost-effective manner.

One train manufacturer estimated that there are potential savings of 20% in the cost of manufacturing trains through a combination of a smoother demand profile, running procurement processes better and standardising vehicles more.

The industry has a history of **poor alignment between predicted and actual spend profiles**. Figures 10.1 and 10.2 show NR's Control Period 3 (CP3) planned versus outturn spend, and Figure 10.3 shows the variation in train vehicle orders.

Figure 10.1: CP3 renewals spend – planned versus actual

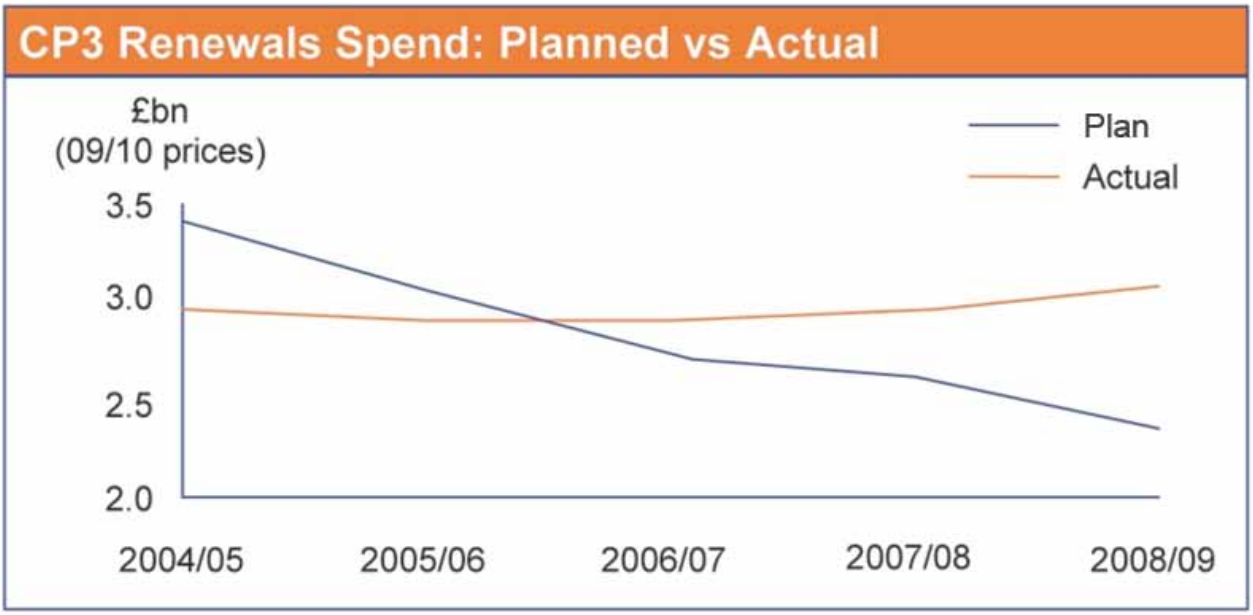


Figure 10.2: CP3 enhancements spend – planned versus actual

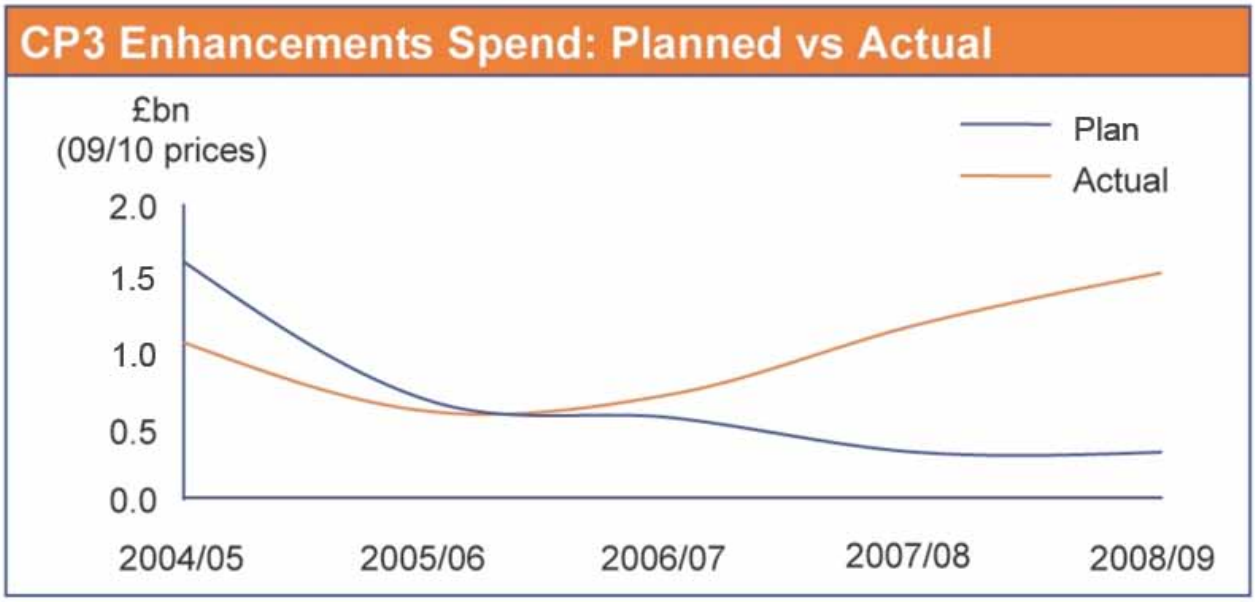
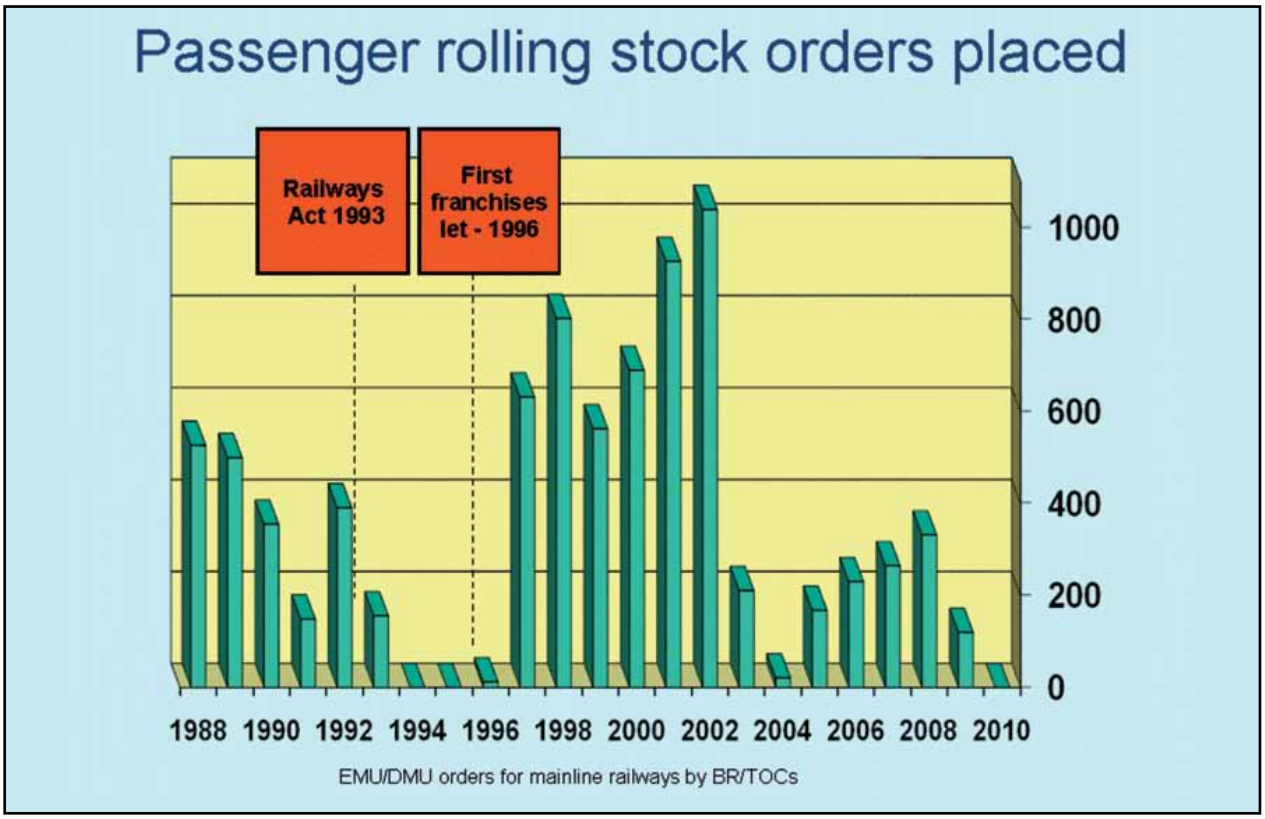


Figure 10.3: Variability of train vehicle orders (RIA)



Several supply industry members gave Atkins examples of **short planning horizons,** whereby infrastructure suppliers are unwilling to invest in more efficient plant that needs to be written-off over seven to ten years, when their contract with NR is far shorter and does not give sufficient certainty of work to justify the investment.

Similarly, one Rolling Stock Company (ROSCO) has estimated that implementing EU requirements on persons with restricted mobility (PRM) modifications after current franchises, rather than during the franchise and at the same time as scheduled overhauls, will cost the industry an extra £190m to £240m.

There was also key data illustrating the **low GB rail volumes** in certain niche markets as a proportion of the wider non-rail market. For example, engine manufacture for rail applications is less than 0.01% of total engine production volumes in the EU. Despite this, the Non-Road Mobile Machinery Directive sets out different requirements for different types of rail diesel engine.

One submission to the Study included a reference to a case study undertaken on nuclear advanced gas-cooled reactor projects, which concluded that a partnership rather than a competitive approach delivered the same outcome for 7% less cost.

A major consultancy in the rail sector observed that "procurement organisations [in GB rail tend to] drive net cost into the industry rather than achieving their prime objective of achieving value for money. Too many times the procurement process is apparently not under the same critical path as the delivery on site".

All these examples strongly indicated that there is a significant opportunity to reduce costs through better supply chain management.

10.1.4 Barriers to efficiency

Although there are examples of good practice supply chain management within GB rail, the Study's analysis indicates that, overall, GB rail still lags behind best-practice supply chain management. Examples include:

- an unpredictable demand profile in many markets that produces a boom/bust effect down the supply chain – this is evident both at Government policy level and within large buyer organisations, who do not generally give suppliers good enough visibility at sufficient enough detail of planned workloads;
- a short-term approach to relationships and investment, particularly in the current TOC franchises – this permeates the supply chain with short-term planning, reducing investment in people, process improvement and equipment. This, in turn, leads to ineffective markets, for example:
  - Train Operating Company (TOC) spares and maintenance for in-service equipment, where the original equipment manufacturer is the only source for specific (often safety critical) spares, e.g. braking systems where the whole EU market is served largely by two companies; and
  - relatively low volumes of work in a niche market such as the UK rail sector act as a barrier to entry for suppliers;
- poor cost transparency both within organisations and at whole-industry level which hinders the ability to make cost-effective buying decisions – NR has made some progress in this area, but there is still a lack of transparency of all-in costs for key activities;
- a poor application of supply chain management – in particular there is little application of segmentation analysis to identify the right commercial approach to use in each particular situation. This leads to attempts to use competition where it is unlikely to be the most appropriate approach;
- poor take-up of collaborative approaches around the high risk/high value procurements, such as re-signalling schemes – there is an assumption that partnering is just another procurement approach, rather than a fundamentally different way of doing business;
- the low take-up of partnering and alliancing has, in part, been driven by previous failed attempts at partnering – these have been caused by a failure to develop the right culture and behaviours, especially at senior management level;
- a lack of supply chain management skills and experience in the rail sector, with an emphasis on behaviours that are geared to traditional competitive procurement alone – this is both at the highest industry levels, where significant commercial deals are negotiated, and at many senior management levels across the industry;
- it is difficult to maintain complex rail systems cost-effectively, where maintainers have insufficient intellectual property rights to maintain, change or update equipment – examples are traction systems with diagnostics software protected under licence and the intellectual property rights (IPR) protecting design information;
- procurement practice is variable, with some good examples, but generally too many bespoke requirements, with large numbers of different systems and subsystems, leading to a high level of unique interfaces, poor reliability, and high integration and spares costs;

- the buyer is often far removed from the end-user, which increases the risk that the wrong goods and services will be procured – for example, centralised purchasing teams within NR HQ, and the Department for Transport (DfT) procuring new rolling stock;
- too many protracted and inefficient tendering processes with little coherence between technical and commercial requirements, with poor scope certainty, and consequently high-risk profiles – this increases the overheads of both procurers and suppliers, as well as acting as a barrier to entry;
- generally a focus on contracting by inputs or outputs, rather than by outcomes – this, coupled with the highly visible nature of the industry, makes it hard to identify cheaper approaches to meet specific needs; and
- it is difficult for suppliers to enter new markets in GB rail – the rail supplier assurance process is cumbersome and gaining recognition as an established and "approved" supplier is seen as a barrier to entry for many suppliers.

The Study is, however, impressed with NR's new proposals for supply chain management (project DIME). These proposals start to address the above issues and include:

- a spectrum of supplier engagement models based upon the specific situation;
- a focus on improved collaboration, based upon clear partnering/alliancing principles; and
- a recognition that getting the right culture and behaviour from the top is critical.

10.1.5 Principal issues

The principal issues in this section closely align with the Infrastructure UK (IUK) findings (Section 10.2). There are three principal issues that need to be addressed.

First, how to ensure that **cost incentives** reduce whole-life, whole-system costs within the current industry structure. This would require addressing the following points:

- The cost incentives in each part of the industry are not strong enough for organisations to challenge their own inefficiencies in supply chain management and to drive towards best-practice approaches to reduce waste and improve value for money.
- The industry structure does not incentivise co-ordinated decisions being made by all players in the supply chain. As a project passes from planning to procurement to delivery and into operation, it passes through different silos. This lack of co-ordination has a significant cost impact down the supply chain. Similarly, changes in specifications can be made in one part of the supply chain that have major implications on other parts, but the whole-system impact and cost are not considered.

Second, how to **better manage industry demand profiles** to deliver cost reductions through better long-term planning and encouraging long-term investment in cost reduction, specifically:

- poor demand visibility prevents suppliers investing in innovation, training, and plant and equipment that would significantly reduce unit costs of production; and
- demand smoothing is hindered by a lack of a long-term strategy supported by good asset information. Without this it is difficult to lock-down planned workloads and award long-term contracts. This reduces supplier investment to reduce unit costs, e.g. in new plant, equipment and training.

Thirdly, how to increase the levels of adoption of best-practice supply chain management. There is a need to improve understanding of the potential cost reductions that are possible and what senior management needs to do in order to achieve this. Compared with other industries there is an overly transactional approach[52] to procurement, which is often not suited to complex or high-risk areas. NR's new partnering framework to programme delivery is starting to address this issue. However, the skills and behaviours of buyers are often still geared towards this more traditional approach, and there is a large capability gap to address before cost reductions can be achieved in full.

10.1.6 Recommendations for cost reduction

As part of the change implementation plan, the Change Team, working closely with the DfT and the Rail Delivery Group, should ensure that the following measures are put in place:

- Stronger incentives to reduce costs while improving outcomes. This is a pre-requisite to reducing supply chain management costs through the adoption of best-practice approaches.
- Clearer and longer-term Government and industry strategies, together with better asset management and planning, should provide the supply chain with improved forecasting, planning and visibility of future requirements. Plans and budgets need to be agreed and aligned at Government and route-level organisations; budgets need to allow for approaches with higher initial costs that reduce whole-life costs; and, risk contingency should be held by the party best placed to manage it, at Government and route level;
- Clearer, and longer-term, Government and industry stratgies, and better asset management and planning should provide the supply chain with better forecasting, planning and visibility of future requirements. Plans and budgets need to be agreed and aligned at Government and route-level organisations; budgets need to allow for approaches with higher initial costs that reduce whole-life costs; and, risk contingency should be held by the party best placed to manage it, at Government and route level;
- The selection of the most appropriate procurement approach for each situation, by considering the risk and value of the procurement. Where collaboration is required, the rail sector should move towards best-practice by adopting BS11000 for collaborative business relationships. Clients need to understand their suppliers' market position and seek to develop an alignment between the parties (see examples in Boxes 10.2 and 10.3).

52 A transactional approach is typified by each purchase being treated as a separate activity, perhaps with little or no connection to wider business objectives. The focus is simply on getting products or services supplied to a certain location by a certain time.

Box 10.2: Cost reduction through partnership – SBB and Sersa

Sersa is a multinational rail maintenance contractor based in Switzerland. Sersa has developed and implemented a range of new approaches to rail switches and crossings (S&C) life extension and renewals. Sersa works in formal long-term partnership with one of its clients, the infrastructure manager SBB, to provide "just-in-time" service to renew S&C layouts for a fixed price per annum. Sersa's approach is to plan possession activity rigorously and to maximise the use of mechanisation and prefabrication. Over a period of four years this has allowed Sersa to develop a working system that replaces an S&C unit in six to ten hours for a cost of £100k–275k.

Sersa claim this is a saving of between 50% and 75% compared with the UK average for a similar job. A similar system is being rolled out in the UK by NR, but by the time it may be implemented in 2013 it would have taken nine years to roll-out, despite the Sersa/SBB system already being proven.

- Improvements in staff competence and behaviour in supply chain management. This should include a basic introduction to supply chain management at all levels to improve industry awareness, and the long-term development of a core of supply chain managers to become the procurement leaders of the future. This will be through a mixture of training, secondments and continuing professional development.
- Improvements in the supplier assurance processes by accelerating the existing Supplier Assurance Framework Project (facilitated by the Rail Safety and Standards Board (RSSB)), which aims to reduce the cost burden of the existing systems and help to unlock the current barriers to market for new entrants.

Box 10.3: Example of supplier development in the supply chain

A ROSCO was in a several single-source relationship with major suppliers for some of its maintenance requirements. Although, initially, these relationships proved cost-effective, over time the quality of service had suffered, leading to customer issues. In addition, prices were to increase significantly once the contracts ended. After carrying out a strategic review of the supply chain, the ROSCO identified a new supplier ideally suited (in terms of business approach, behaviours and attitudes) to be developed into a credible alternative.

The new supplier, traditionally geared to the freight market, had carried out some minor passenger work previously, but had not delivered any large-scale overhauls. The key advantages the new entrant had over some of its competition was its can-do culture and desire to grow, attributes that fit very well with the culture of its customers. The train owner gave the new supplier its first maintenance contract and, subsequently, its first ever major train refurbishment project. Both were delivered 100% on time and to the cost targets. On the back of this success the supplier has gone on to win substantial work from other ROSCOs and TOCs, and has become a leading player in the passenger train overhaul and repair market, its annual turnover increasing three fold over a period of 10 years.

10.1.7 Potential for, and timings of, cost savings

Initial estimates for the savings that can be achieved, based upon Atkins and Arup's work are shown in Figures 10.4 and 10.5. As indicated earlier in Section 9.1.7, better asset and supply chain management can achieve between **£168m and £425m operating costs (opex)** and **£287m and £722m capital costs (capex)** per annum by 2018/19.

Figure 10.4: NR and TOC opex savings estimates

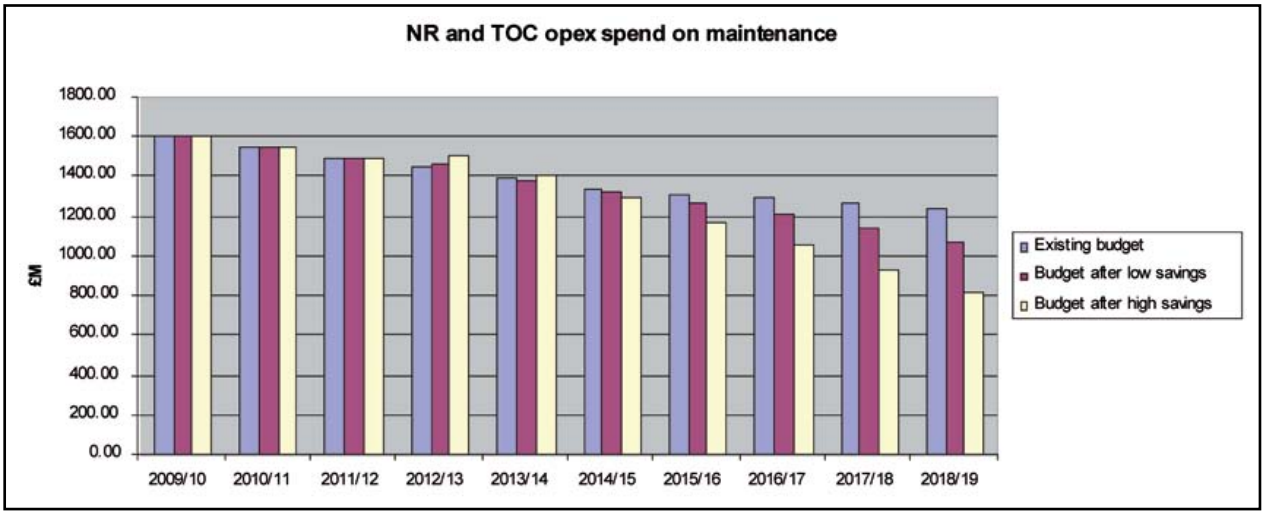
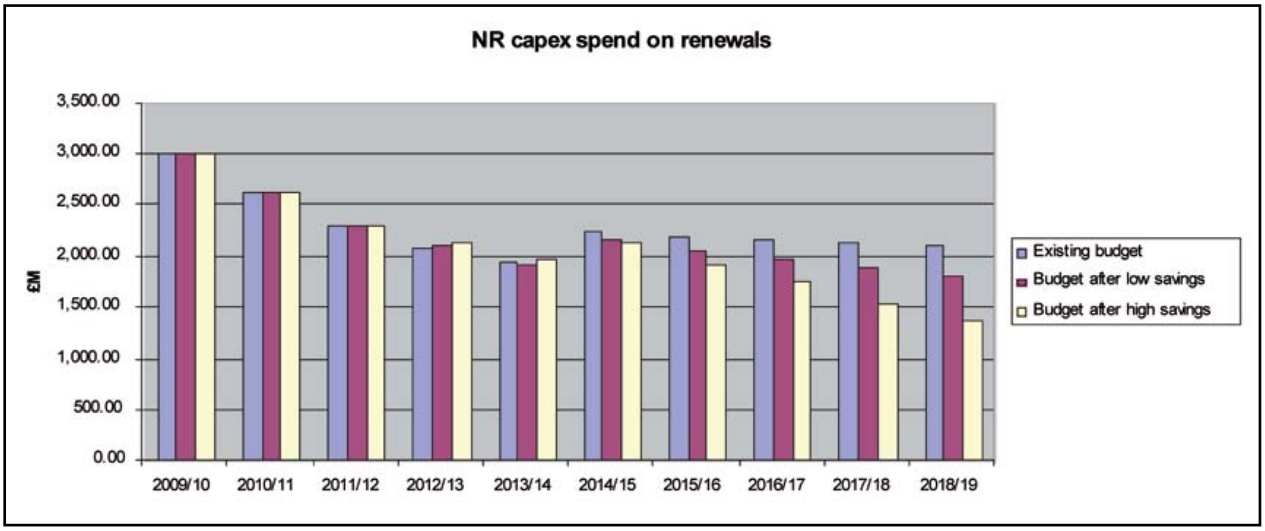


Figure 10.5: NR and TOC capex savings estimates



In combination with the asset management initiatives explained in Section 9, the supply chain element of the savings will generally come from:

- reduced overheads through a reduction in man-marking and simplified processes;
- reduced work volume (scope and specification) through smarter definition of requirements, e.g. through earlier involvement of partners; and,
- reduced cost of work delivery through better performance and less risk.

The earlier the incentives for collaboration can be put in place, the faster the savings can accrue. The widespread adoption of partnering and alliances across the industry will also deliver significant cost reductions.

As discussed in the previous section, it is difficult to separate the asset and supply chain management savings as they are strongly interconnected. As better asset management reduces the work volumes necessary, the addressable costs for supply chain reductions decrease. However, better supply chain practices, especially increased collaboration, often enables radically cheaper asset management practices.

This means that the benchmarks used to calculate the potential savings are for both asset and supply chain management.

10.1.8 Implementation plan

A **suitably qualified and experienced implementation team** should be established with a detailed implementation plan that includes both short-term and longer-term activities as follows.

Within the next 12 months, industry bodies, major enhancement programmes, and particularly NR, TOCs and ROSCOs should review the issues in this document and analyse their procurement strategies in order to develop any additional improvement plans. This may involve training, assessment and further development of their own organisations.

In the longer-term, the Change Team and the RDG should ensure that:

- the development of the new GB rail structure:
  - includes clear incentives for cost reduction, outcome improvement and innovation;
  - supports the adoption of strategic supply chain management;
  - considers supply chain management functions at all levels; and
  - ensures that the plan can clearly demonstrate how the new structure is going to deliver the supply chain management benefits;
- improved industry-wide processes are developed, particularly new industry-wide planning and budgeting processes, and adoption of best-practice frameworks such as BS11000 on collaboration. Specifically, this will require:
  - ensuring that plans and tools are in place to improve demand management across the various rail markets;
  - ensuring that procurement approaches are using partnering and collaboration where the market conditions and risk profiles are appropriate, and, importantly, that the people involved know what needs to be in place for success; and
  - ensuring that the Supplier Assurance Framework Project is adequately resourced and focused to deliver the benefits of a more open market for new entrants;
- plans are put in place to improve the skills, experience and behaviours of the key people involved in supply chain management through:
  - the formation of a specialist industry group for procurement and supply chain management to develop further knowledge, skills and appropriate behaviours, and to promote procurement as a profession; and

– establishing a supply chain management education programme for all relevant railway staff, including a senior supply chain management leadership development scheme.

10.2 Infrastructure UK and the GB rail industry

10.2.1 Background

Infrastructure UK (IUK) has a remit from the HM Treasury to provide a stronger focus on the UK's long-term infrastructure priorities across the economic infrastructure sectors (energy, transport, waste, flood, science, water and telecoms), particularly on the issue of how to lever in more private-sector capital.

As a result of IUK's work, the Prime Minister launched the Government's National Infrastructure Plan 2010, which sets out the challenges and a work programme of deliverables to improve the approach to infrastructure planning, prioritisation and delivery in the UK. The plan comprises a spend rate of £15bn–20bn per year.

IUK's core remit is:

- to provide greater clarity and co-ordination over the planning, prioritisation and enabling of investment in UK infrastructure; and
- to improve delivery of UK infrastructure through achieving greater value for money.

The second bullet point is closely related to elements of the Study.

IUK findings in this area were published in the *Infrastructure Cost Review*[53] report on 21 December 2010 and an implementation plan on 1 April 2011. The report details its investigation into how to reduce the costs of civil engineering works for major infrastructure projects.

In this section, the Study explores the common findings between the Study and IUK, any areas of difference, and future opportunities.

10.2.2 IUK's cost review findings

The IUK report identifies a number of drivers for the higher cost of construction in the UK compared with other EU countries, and supports the view that higher costs for UK infrastructure are mainly generated in the early project formulation and pre-construction phases. Efficiency improvements could lower the costs of delivery and realise potential benefits of up to 15% per annum (around £2–3bn). A number of specific areas where IUK is considering taking action to deliver these benefits have been identified. A prioritised work programme for implementation is expected to have been finalised and announced shortly.

The weight of evidence confirms that UK civil engineering is more expensive than its European peer group and demonstrates that there are significant opportunities to reduce costs in the delivery of infrastructure. There is no single overriding factor driving higher costs. However, IUK has identified that higher UK costs are mainly generated in the early project formulation and pre-construction phases.

53 See www.hm-treasury.gov.uk/d/cost_review_main211210.pdf.

10.2.3 Comparison with the Study's findings

As part of the Study's review of asset management, supply chain management and programme management, the Study found significant opportunities to reduce costs and improve the value for money of infrastructure works. The Study's findings align closely with the seven principal findings in IUK's executive summary. The links between these findings and those of the Study are summarised below.

IUK Finding 1 – Stop/start investment

This was a key opportunity identified in the Study's interim submission. The corresponding recommendations are included in Section 10.1 (supply chain management) within this report. They set out how to reduce the stop/start investment cycles across different parts of the rail industry.

IUK Finding 2 – Lack of clarity and direction at inception or early design

This links with the recommendations under Section 9.2 (whole-system programme management), where the Study has identified that there is insufficient rigour and clarity in the early stages of programmes. There is often poor definition of the problem that is to be solved, there is a general failure to rigorously assess a range of alternative solutions, and a poor articulation of the compelling purpose, and the benefits that are aimed for.

IUK Finding 3 – Commercial management to a budget price

This is related to weaknesses in supply chain and programme management through the inappropriate or premature allocation of contingencies to different levels of a programme or project organisations. It is addressed by the recommendations in Sections 9.2 and 10.1 for an assessment of the gaps in skills and experience, and a drive to improve towards best-practice.

IUK Finding 4 – Over-specification and use of too many bespoke solutions

This issue of over-specification is referred to in both Sections 9.2 and 10.1 (programme management and supply chain management). There is a broader link to the overall lack of focus on cost reduction, which often translates to a tendency to design solutions to generic standards, rather than designing to minimum requirements (by challenging the standards). Regarding the over-use of expensive bespoke solutions, the Study recommends improving supply chain management awareness, skills and behaviours at key levels in the industry so that a more strategic approach is developed to increase standardisation and modularisation.

IUK Findings 5 and 6 – Use of competition and lack of strategic supply chain management

The low take-up of collaboration in rail, and the inappropriate use of commercial and contractual models, were a strong finding in Section 10.1 on supply chain management. As described above, the Study has made recommendations that aim to improve skills, experience and behaviours in this field.

IUK Finding 7 – Lack of investment in key skills

This almost certainly stems from the lack of a steady predictable flow of work that could provide sufficient forward certainty for suppliers to invest more in their people or processes. Again, this is covered as part of the recommendations in supply chain management.

10.2.4 Opportunities for joint implementation

IUK have set out an implementation plan that is designed around five key interlinked objectives to:

- create better visibility and continuity of the infrastructure investment pipeline, through publication of the future investment programme in the National Infrastructure Plan;
- implement effective governance of projects and programmes, particularly in the public sector, by ensuring clear accountability for key project decisions;
- instil greater discipline in the commissioning of projects and programmes by ensuring greater objective challenge of the specification of requirements and cost estimates;
- develop smarter ways to use competition by improving risk-based assessment of procurement options; and
- create an environment that encourages industry and the advisory community to invest in efficiency and reduce the direct costs of construction by developing cost-effective delivery solutions.

With regard to common areas of implementation, the Study has agreed with IUK that it is important that the clear synergies between the findings of both studies are exploited. In particular:

- the Study's proposals for longer-term, whole-industry financial planning strongly support IUK's aim of developing a long-term UK-wide infrastructure plan for Government, while aiming to reduce the stop/start investment cycles that drive cost into the industry; and
- there is merit in jointly piloting the Study's proposed improvements in programme management with IUK. The new approach addresses many of the issues IUK has identified that are clearly generic across many non-rail sectors. The best-practice approach could be piloted and further refined in GB rail before a wider cross-sector roll-out.

To achieve this, it is important that the Change Team under the guidance of the Rail Delivery Group ensure continued close working with IUK during 2011 and 2012.

11. Area G – Safety, standards and innovation

11.1 Safety

11.1.1 Description of studies and analysis

The Study has investigated whether or not the GB rail industry's approach to safety is conducive to improving efficiency. The Study recognises that safety is paramount and found **that the rail industry is safe, and is getting safer**, but there is a commonly held view that the industry will have to work even harder to achieve continuous improvement in safety. The Study found concern that the industry's attitude to safety was based on a prescriptive environment, which tends to build in extra costs, and was not always taking advantage of current thinking on safety, which regards safety management as a fundamental part of running a business.

11.1.2 Evidence base

The Study commissioned research as part of a wider ranging examination of all Area G's subjects. A number of people from other industries and the academic world were interviewed to help its assessment of the problems and the solutions. The stakeholder group for Area G included senior industry people with operational safety responsibilities and those directly involved in safety regulation.

The study has drawn on external research studies, internal work and documents published by various industry bodies, including:

- AD Little (2010) *Achieving Value for Money in Safety, Standards and Innovation* (DfT Contract number PPCA10046);
- Risk Solutions Ltd (2011) *Achieving VfM from a Railway Systems Authority* (DfT Contract number NRP10030);
- paper by Professor Andrew Evans of Imperial College (2011) relating to the use of cost benefit in making safety decisions;
- a workshop for industry leaders and safety professionals;
- Rail Safety and Standards Board (2009) *Taking Safe Decisions – How Britain's Railways Take Decisions That Affect Safety*;
- Professor Andrew Evans (2004) *Railway Risks, Safety Values and Safety Costs*;
- Charles Haddon-Cave QC (2008) *The Nimrod Review*;
- formal inquiry reports into rail accidents;
- the Office of Rail Regulation's (ORR) report (2010) on its review of the Railway Safety and Standards Board (RSSB);

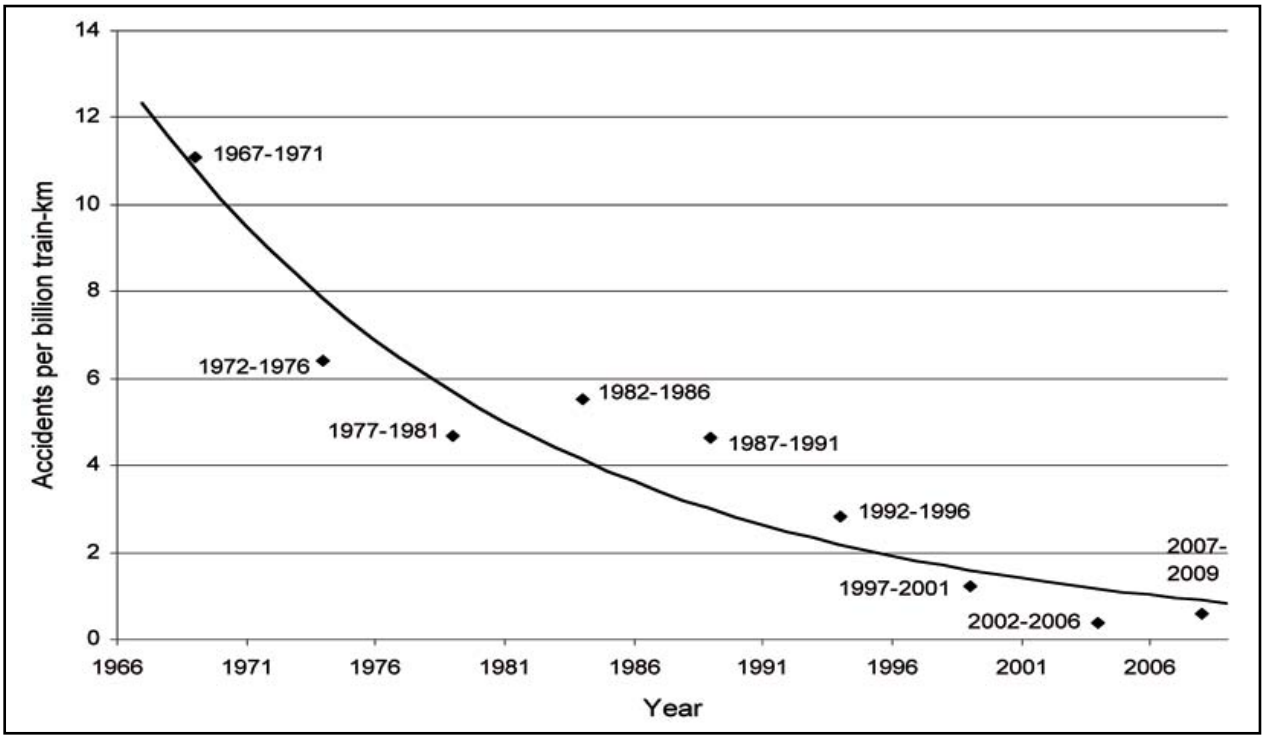
- RSSB *Annual Safety Performance Report 2009/10*; and
- a review of the GB rail industry's safety culture by the Study.

In addition, discussions were held with industry parties and evidence was sought as to where improved value for money could be identified in the industry's approach to safety.

11.1.3 Background information and key data

Work undertaken by Evans[54] indicates that, for fatal train collisions and derailments, Britain has a record comparable with that of France and Germany, with all three countries having about 0.6 fatal train accidents per billion train-km. When compared with other countries, all three are among the best in Europe. Figure 11.1 shows that since 1967 there has been a continuing long-term trend of safety improvement in the UK.[55]

Figure 11.1: Fatal train accidents per billion train-km, 1967–2009

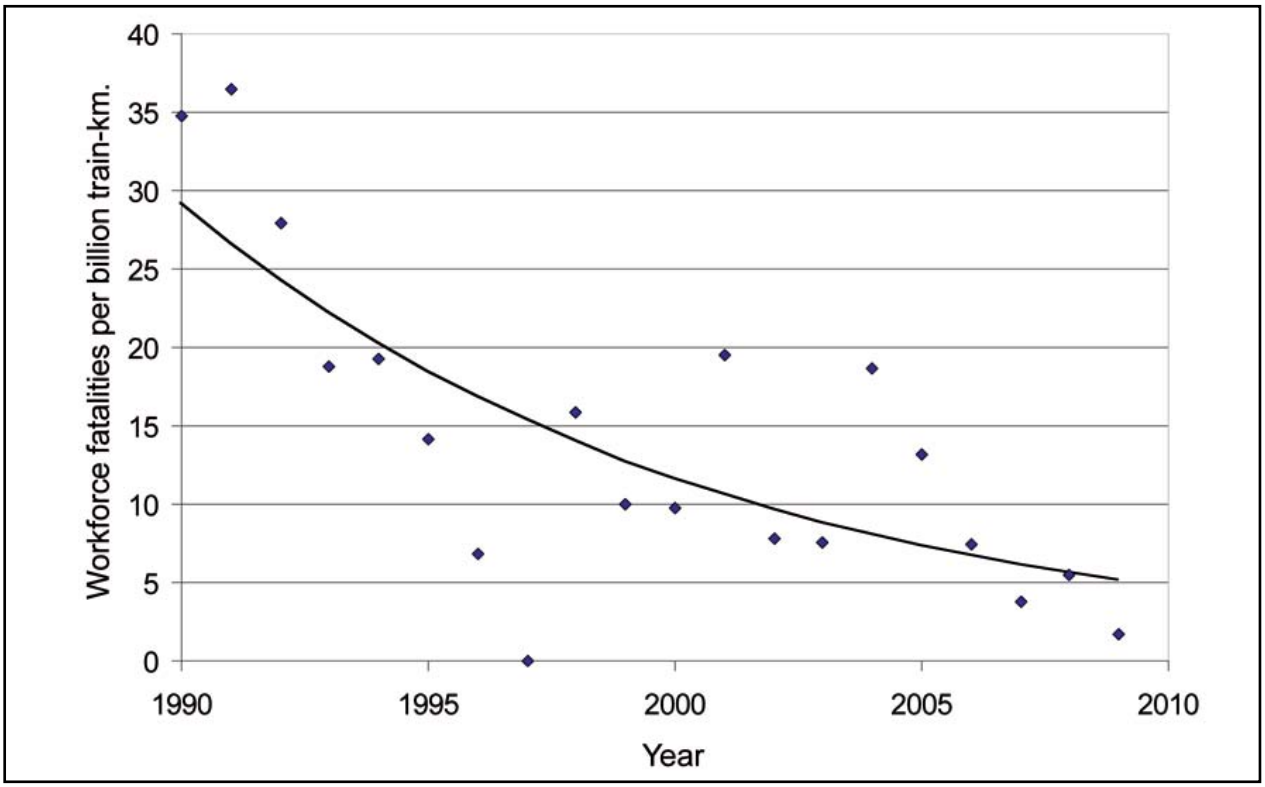


A key indicator for the mainline railway is RSSB's precursor indicator model for train accident risk to passengers, the workforce and members of the public, such as motorists. In 2009/10, work by the ORR using the model showed an 11.35% improvement on the previous year.[56]

The RSSB and ORR reports also show that since the 1980s worker safety has also shown a steadily improving trend, with the number of deaths falling from around 23 per year in the 1980s to three in 2009/10. Analysis by Evans for the Study is shown at Figure 11.2.

54 Evans, A. W. (2011) *Fatal Train Accidents on Europe's Railways: 1980–2009*.
55 Evans, A. W. (2010) *Fatal Train Accidents on Britain's Mainline Railways: End of 2009 Analysis*. London: Imperial College.
56 Office of Rail Regulation (2010) *The ORR Health and Safety Report*. London: ORR.

Figure 11.2: Main line workforce fatalities per billion train-km – Great Britain, 1990–2009



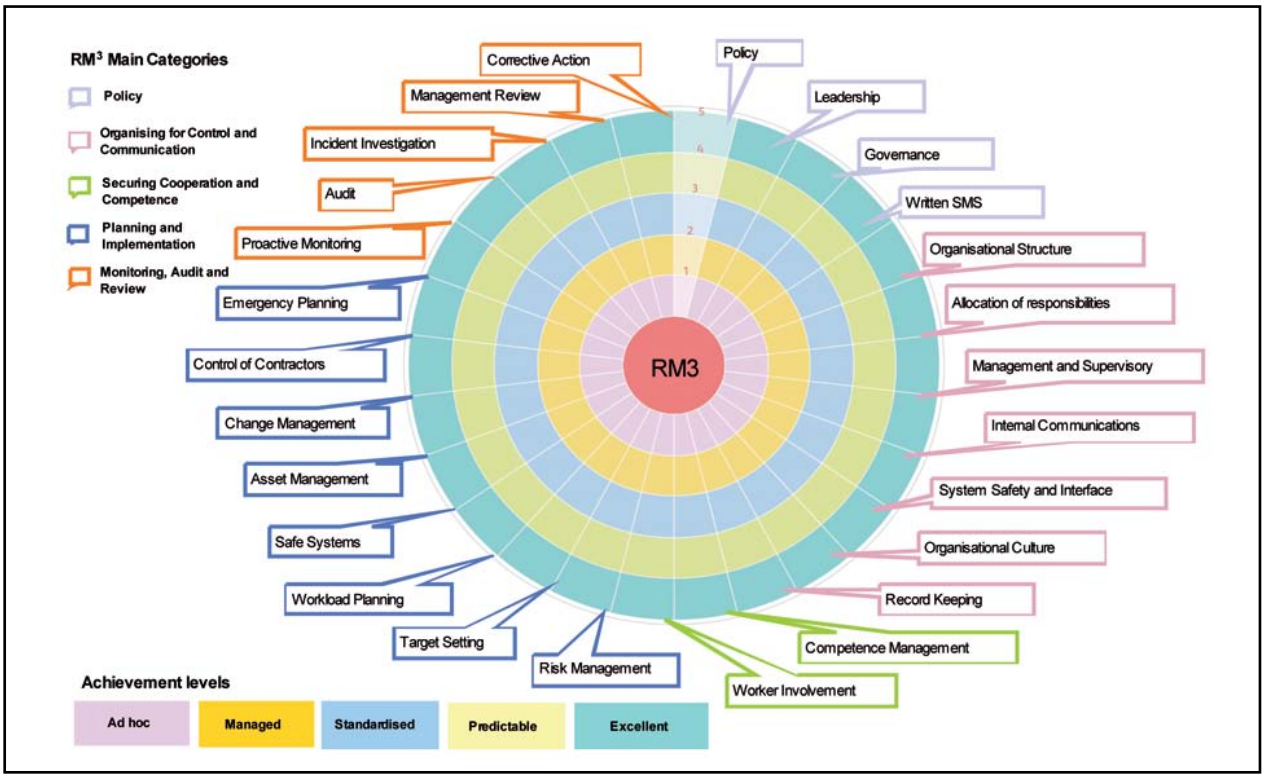
Despite these positive indicators, safety enforcement action by the ORR continues to be required.[57] This underlines the fact that the industry should never become complacent about safety and should always pursue continuous improvement.

The ORR's Railway Management Maturity Model[58] identifies the features that would be expected of an organisation seeking to achieve excellence in its safety management system, recognising that an excellent organisation will meet its legal requirements in an efficient way – the model considers the benefits to the organisation as a whole and looks actively for further improvements in controlling risk. The Model describes the components of an effective safety management system such as leadership, competence and risk management.

Every organisation within the railway industry will be performing at a different level of achievement for each component. There are five levels of achievement, from "ad hoc" (poor) through to "excellent" and the Model describes what would be expected at each level for each component. This allows a comparison to be made between the actual situation found within an organisation and the description of what was expected, and to deduce where the organisation is on the scale of management capability for that component. The Model is illustrated in Figure 11.3.

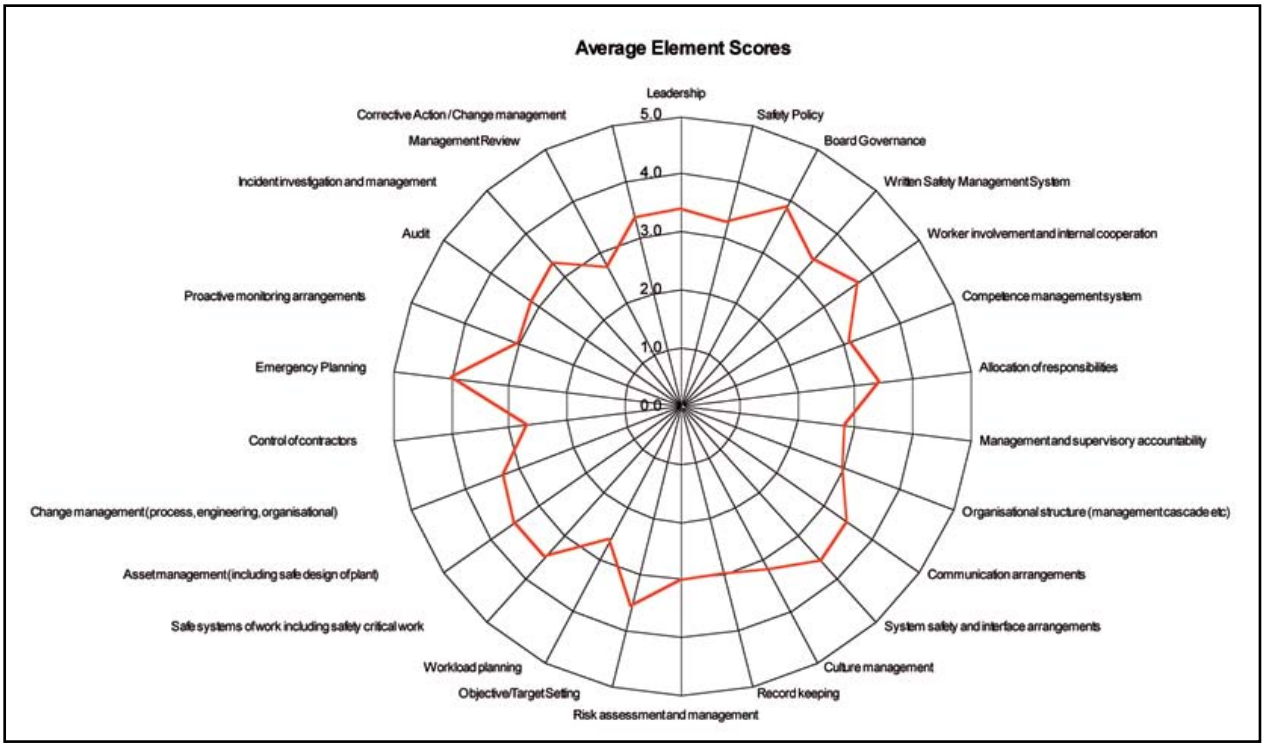
57 Office of Rail Regulation website www.rail-reg.gov.uk/server/show/nav.1847.
58 www.rail-reg.gov.uk/upload/pdf/management-maturity-model.pdf.

Figure 11.3: Railway Management Maturity Model



The ORR's assessment of the industry's safety maturity using the Railway Management Maturity Model is shown in Figure 11.4.

Figure 11.4: "Whole-industry" Railway Management Maturity Model score[59]



59 Information provided by the ORR to the Study.

The ORR has advised the Study that its analysis of organisations ranging from small Train Operating Companies (TOCs) to large infrastructure managers indicates that "managed", "standardised" and "predictable" judgements were the most frequently used to describe the management capabilities of railway companies, with no companies in the "excellent" band. The overall result of the assessment was an industry rated as "average", which, while demonstrating the industry is safe, also shows that improvement is necessary and achievable.

11.1.4 Barriers to efficiency

Although the GB rail industry's safety statistics demonstrate an improving record, the perception is that this is achieved in an **expensive manner with an extensive suite of rules, standards and processes** governing behaviour. There is a lack of maturity in the safety culture of the industry. One result of this is that, despite the emergence of less prescriptive safety legislation, the industry still takes refuge in these rules, standards and regulations and sometimes displays uncertainty on how to meet its safety obligations.

Experience in other industries shows greater progress being achieved towards a mature safety culture. While the Study has reviewed the industry's safety culture, it has not undertaken a comprehensive assessment of its maturity, but there are enough indicators to show that there is room for improvement.

From its consultations, responses and research, the Study found evidence of a **safety culture that fails to manage risk optimally.** This included examples of risk-averse behaviours in the industry as demonstrated by the elevation of simple decisions on safety to senior management and committees, a tendency that was highlighted in research by AD Little.[60]

There is an **absence of clear leadership at a strategic level** capable of taking a whole-industry view on safety. This causes an absence of a clear vision for safety in the industry and could ultimately impact on the attitudes, behaviours, values and beliefs in relation to safety and risk management held within individual organisations.

Industry leaders have commented on a **lack of focus on behavioural safety** in the industry. This can create a situation where, for example, the workforce may believe that "getting the job done quickly" is management's highest priority, and may resort to risk-taking behaviours with potentially adverse consequences for both safety and cost.

The **failure to manage occupational health risks** and the prevention of ill-health issues costs the industry money. A case study cited by the ORR indicates that a return of 10:1 can be achieved through better management of occupational health issues.[61]

Despite very useful guidance offered by RSSB[62] there is often a **lack of clarity about the justification for expenditure on safety**. Where expenditure is required by a legal duty, it must be made, but it may also be influenced by commercial and policy issues. The application of the principle of reducing risks so far as is reasonably practicable (SFAIRP) or as low as reasonably practicable (ALARP) is not always well understood. Examples include:

- the view that, in certain circumstances, more money should be spent than would be required to meet legal requirements to counter a detrimental effect on company reputation;

60 Arthur D. Little (2005) *Risk Aversion in the UK Rail Industry*. London: Department for Transport.
61 www.rail-reg.gov.uk/upload/pdf/oh_back_physio_casestudy.pdf.
62 Railway Safety and Standards Board (2009) *Taking Safe Decisions – How Britain's Railways Take Decisions That Affect Safety*. London: RSSB.

- the introduction of measures that significantly exceed legal obligations for reasonable practicability (costs and effort are grossly disproportionate to safety benefits) because of the expressed or inferred preference of society, sometimes as interpreted by political leadership; and
- a concern, expressed at the industry safety workshop, that there may not be sufficient connection between safety and economic regulation, with the result that the consequences of a safety-related decision on economics and vice versa may not always be considered effectively.

The **external environment may also have a negative effect on safety behaviour** due to influences such as:

- intense public and media scrutiny following rail accidents, which promotes risk-averse behaviours;
- the response of railway staff and managers to external influences, and discomfort with taking personal responsibility for safety in the current safety legislative environment, can also lead to risk-averse behaviours;
- the belief that society expects much higher safety standards from corporations than an individual is willing to impose on himself; and
- the role of prosecuting authorities in the investigation process where the focus often appears to be on seeking out individuals who can then be held to account, even if the root cause is a system failure. This is seen as reflecting a public and media desire for there to be someone to "blame".

Safety performance is not promoted through contracting relationships, such as the current franchise arrangements, thus diminishing its importance in comparison with other contractual obligations.

Safety and risk management are dependent on having the correct tools and processes available to allow informed decisions, based on sound data, to be made. **Suppression of safety data**, as highlighted by Unite and described in RSSB's recent review of RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995) reporting by NR and its contractors,[63] would be a significant barrier to improvement as would be incentives that discourage accurate reporting.

The industry's **reliance on casual labour** in some areas of activity, and limited control over the hiring arrangements, may also combine to weaken the safety culture in the industry.

11.1.5 Principal issues

The principal issue is **how to develop a stronger safety culture** in the industry that can drive continuous improvement in safety and occupational health in a cost-efficient manner, based on better understanding and management of risk, stronger leadership and improved competences.

Arising from this is a need to understand how **an improving learning culture** can be developed that will enhance competence within the industry. This needs to be combined with a willingness and ability to draw the correct conclusions from the evidence presented. Improved competence enables risks to be managed efficiently and cost-effectively without the need to rely on excessive amounts of procedures and processes.

63 Rail Safety and Standards Board (2011) *Independent Review of RIDDOR Reporting by Network Rail and its Contractors*. London: RSSB. This document can be accessed at www.rssb.co.uk/SiteCollectionDocuments/RIDDOR%20Review.pdf.

The industry must determine how it will ensure that Safety Management Systems **focus on the optimal management of risk** in a manner that emphasises continuous improvement. Safety should be about ensuring that the right things are done in a cost-efficient manner while ensuring legal compliance.

The industry must decide how to **review more critically the information and data available** to it regarding its risk profile. By doing this, the industry can monitor its performance and evaluate precursor indicators that give early indication of the risk of future safety related incidents.

The Study has noted the benefits of a **process of peer review or benchmarking** that is used by the nuclear industry. The World Association of Nuclear Operators[64] runs an effective peer-review process operated on the basis of improving performance through mutual support, exchange of information and emulation of best-practice. The industry should assess how such a process might be adopted.

The industry should also decide how to **increase attention to behavioural safety** where the focus is on observing the actions of employees, identifying unsafe behaviours, and taking corrective action. The purpose is not to apportion blame, but to identify and measure so that the unsafe acts can be managed. This requires workforce participation, a targeted approach to unsafe behaviours, data collection, improvement actions based on analysis of the data collected, regular feedback and visible management support.

An effective approach to safety management must be based on risk control, as required by law. The industry should **assess how best to use modelling and guidance** to achieve this approach using management models and guidance, such as the ORR's Railway Management Maturity Model, the European Foundation for Quality Management (EFQM) maturity model, the Health and Safety Executive's (HSE) *Successful Health and Safety Management*[65] and RSSB's *Taking Safe Decisions – How Britain's Railways Take Decisions That Affect Safety.*[66]

11.1.6 Recommendations for cost reduction

Despite the achievement of improved safety by a fragmented industry, the Study believes that the industry's safety record can become even better, which can be achieved at lower overall cost, through improved safety leadership. To achieve this improvement the Study recommends the creation of a National Safety Task Force that would be structured and staffed in the same way as the existing National [Performance] Task Force, with representation from TOCs at Managing Director level and NR Executive Directors, supported by a small secretariat.

The National Safety Task Force would be guided by the Rail Delivery Group and supported by the Rail Systems Agency (RSA) and would:

- provide clear and credible leadership for safety and risk management across the industry, and would work closely with the RSSB and the ORR;
- promote a proportionate risk-based approach to controlling risks in a cost-efficient manner;
- increase the focus on occupational health, which will reduce levels of sickness and absenteeism as well as encouraging a healthier workforce;

64 www.wano.info/.
65 Health and Safety Executive (1997, reprinted 2008) *Successful Health and Safety Management HS(G)65.* London: HSE.
66 Railway Safety and Standards Board (2009) *Taking Safe Decisions – How Britain's Railways Take Decisions That Affect Safety.* London: RSSB.

- encourage the industry to introduce behavioural safety programmes at a local level that focus on the particular risks applicable to the different parts of the industry;
- encourage the use of professional guidance on managing risk;
- establish a peer-review process for the industry to allow benchmarking of safety and risk management processes;
- discourage the suppression of data and information that would help the industry learn and thus improve safety – it will not be acceptable to set targets and incentives that encourage suppression of information; and
- discourage personal risk aversion, lack of individual accountability and excessive "double-checking" in safety management.

The responsibility of individual duty holders would remain unchanged, but the aim would be to create a more supportive environment and improvement in the industry's ability to understand and to manage risk.

The Study also recommends that:

- the RSA, the formation of which is explained in the section on standards (Section 11.2), provides support to the industry in safety management and research;
- a common approach to modelling safety should be used throughout the industry – the Railway Management Maturity Model appears to best meet the needs of the industry;
- safety performance metrics should be enforceable on all industry parties to incentivise companies to strive for better standards of safety and risk management;
- the ORR should develop clearer links between the economic and safety regulation aspects of its work – this would ensure that each element of regulation recognises its effect on the other;
- expenditure on safety, which must be in accordance with legal duty, should be appropriate and commercial, and policy considerations should not drive inefficient spend; and
- the industry should encourage external responses to incidents to be measured and on a par to responses found in other transport modes.

11.1.7 Potential for, and timings of, cost savings

Elsewhere the Study has made specific recommendations for cost reduction. In the area of safety, quantifying cost reduction opportunities is complicated. Improved safety means a more effective workforce, less disruptive incidents and less damage to equipment. The principal beneficiary, though, is the individual who might otherwise have suffered harm. Placing a monetary value on the prevention of casualties is a well-established technique, but the principal benefits of the prevention of casualties accrue to the individuals concerned, not directly to the industry. Furthermore, there are very few industry costs that can be identified as purely safety related and separately identifiable from the underlying costs of the industry.

By encouraging changes in safety culture and removing overlaps and duplications, decisions can be made quicker and benefits can be accrued sooner. Creating an environment where safety leadership and a commitment to safety is second nature requires effort. Communication, education and continually refreshed drives for safety improvement do not come free. The expenditure to improve attitudes to safety could generate net benefits of £15m a year, as

identified by ADL. The resulting improved safety culture would lead to fewer lost-time accidents, less disruption and improved performance.

11.1.8 Implementation plan

Strengthening leadership in safety is not something that has to wait for any structural, contractual or political developments. It is within the power of the industry to make change – it does not require the involvement of administrators, regulators or other bodies.

The industry should come together at the highest level to give clearer leadership on safety and to give impetus to the drive for continuous improvement. The creation of a National Safety Task Force, building on the success of the National Task Force, addressing performance, is within the grasp of the industry. The Task Force should produce and implement a plan of campaign, using the many tools and techniques available, for continuous improvement in safety within the following timetable:

- **Quarter 3, 2011**:
  - The National Safety Task Force should be created.
- **Quarter 4, 2011**:
  - The National Task Force should produce a continuous improvement plan for the industry.
- **Quarters 1 and 2, 2012**:
  - The Plan should be rolled out and implemented across the industry.
  - The Railway Management Maturity Model should be applied across the whole industry.
  - The process of peer review should be introduced into the industry.

In addition, the ORR, as independent safety regulator for the industry, will need to ensure that structural changes made in response to the Study's overall recommendations comply with the industry's safety obligations.

11.2 Standards

11.2.1 Description of studies and analysis

The Study began its consideration of standards in response to wide-ranging comments that there were too many standards, they overlapped, were in conflict and created excessive cost and delay. As the issue was investigated, the Study found that there were wider problems around the system-wide management of operational, engineering and technical issues. Such issues are dealt with throughout the industry in an uncoordinated manner, and standards management was found to be just one aspect of the problem.

11.2.2 Evidence base

The Study commissioned external advice, drew information from a range of sources in its work, and produced desktop research focused on establishing the basic facts around system-wide issues and standards.

The primary sources of the Study's information in this part of Area G were:

- AD Little (2010) *Achieving Value for Money in Safety, Standards and Innovation* (DfT Contract number PPCA10046), research undertaken for the Study;
- Steer Davies Gleave and Risk Solutions (2011) *Achieving VfM from a Railway Systems Authority* (DfT Contract number NRP10030), research undertaken for the Study;
- external research studies and documents published by industry bodies:
  - report on the ORR's review of RSSB (2010); and
  - ORR (2009) *Review of Standards Regimes in Use on the National Rail Network*;
- Input from the Area G Stakeholder Group.

11.2.3 Background information and key data

System-wide approach

The Study initially sought information relating to standards, but many respondents made it clear that problems with standards were a symptom of a wider issue relating to a failure by the industry to look at technical issues on a system-wide basis. Respondents argued convincingly that a lack of a system-wide approach imported delay to, or prevented implementation of, specific initiatives.

Respondents supplied, on a confidential basis, a number of examples of how costs could have been saved, but commercial considerations relating to specific projects prevented consultees from providing detailed data that could be published.

In its research the Study has found examples of projects that suffered from the lack of a cohesive cross-system approach. Despite the best endeavours of individual companies and administrative bodies, these projects suffered from a combination of delay, unplanned cost, less than ideal compromise solutions and failure to progress. The projects included:

- introduction and application of next generation signalling technology;
- specifying, procuring and fitting new on-train communications systems;
- determining the characteristics of the replacement InterCity train;
- implementation of regenerative braking fitted on modern rolling stock;
- procurement of standardised rolling stock for new projects;
- introduction of new methods of monitoring the condition of rolling stock and its component parts; and
- individual projects requiring operator and infrastructure manager to work together.

Aggregated data from a group of projects and reference to other railways, transport modes and industries provided helpful information on potential solutions. A range of non-financial data supported arguments about the shortcomings of the existing approach and identified opportunities for change.

Standards

The Study's research into standards noted that European Technical Standards for Interoperability (TSIs) define essential requirements to be met for subsystems and components to be used on the railway. Where the TSIs are silent on an issue, or where there are routes to which the TSIs do not apply, or where there are local network characteristics that need to be covered to ensure network consistency, the Member States provide formal statements of the requisite standards, the National Notified Technical Rules (NNTRs).

In Britain, most of these are included within the Railway Group Standards (RGSs), which apply to the infrastructure controlled by NR. At the request of the industry, RSSB manages the RGSs. There are currently 171 RGSs, as well as Rail Industry Standards, guidance notes and codes of practice.

Company standards are also maintained by companies to support their design and procurement processes. NR, as the Infrastructure Manager, has around 1,250 company design standards and 122 guidance notes.

Other standards are applicable to the railways, for example, Euronorms and British Standards.

11.2.4 Barriers to efficiency

System-wide approach

Despite the best endeavours of a number of individuals, and organisations such as RSSB, to encourage a whole-system attitude, the Study found a fragmented and dysfunctional approach to system-wide issues. The current industry structure and contractual regime appear to discourage individual parties in the industry from taking a systems approach in which decisions are taken that are optimal for the entire rail sector in the longer-term.

The Study identified a variety of industry bodies seeking to act and speak for the industry on system-wide technical issues, including, but not limited to:

- the Department for Transport (DfT), especially the Rail Technical and Professional division;
- NR, which has sought to take a whole-industry approach on a number of national projects;
- the ORR, which contains some technical expertise within its organisation;
- RSSB, which has sought to be an industry-wide repository of knowledge and research into issues that extend beyond its safety remit;
- Trade Associations such as the Railway Industry Association, the Association of Train Operating Companies (ATOC) and the Rail Freight Operators' Association that represent their members' interests in discussions on system-wide issues;
- individual operators – passenger and freight; and
- individual suppliers.

Everybody involved felt that they were trying to act in the best interests of the industry, and each commented that progress was hampered by other industry parties prioritising their own interests and not taking a system-wide view of whole-industry benefits.

The slow progress on certain cross-industry projects and the fragmented approach to developing an industry wide strategy for efficiency enablers, such as information systems, were cited as an effect of the absence of a system-wide approach.

Standards

On standards the Study found that:

- standards were often used as an excuse for not thinking "outside the box";
- standards were sometimes used as a defence mechanism to justify the development of traditional rather than innovative solutions;
- where standards were not mandatory, decision-makers felt exposed if they did not implement them anyway; and
- decision-makers often use industry processes to "syndicate risk", sharing responsibility for the decision. This makes the decision-making process long, costly and uncertain, which discourages people from offering innovative solutions that might involve derogations or changes to standards.

Detailed knowledge of the standards regime, the change process and the interaction between standards was understood by those with close involvement in the subject. They were less well understood elsewhere in the industry and not well understood by senior managers in the industry, who commented critically on the absolute volume of standards used by the industry. The Study noted the ORR's comment:

> "*Given the complexity of the standards regime, [the ORR] found an opportunity to help those in the industry who are infrequent users, to find their ways around the standards regime better, and to challenge or seek derogations when appropriate*."[67]

Although Railway Group Standards were found to be mainly output-based and regarded as fit for purpose, gaining derogations from them or making changes to them was reported to be a lengthy process. The Study was informed that changes to certain standards could take at least 15 months.

Related to this was a concern that there was a disconnection between the setting of standards and the impact on industry cost. The ORR noted that:

> "*Standards committees could be more effective by taking a wider strategic view with an emphasis on the implications of their proposals on the whole-system, particularly cost.*"[68]

Other barriers found by the Study were that:

- conflict between Railway Group Standards and Company Standards, and between railway standards and external standards, caused delay and increased cost while the conflicts were resolved;
- the quantum of standards in total and those applicable to a particular project or initiative deterred new ideas – this appeared to be more of an issue with company standards than Railway Group Standards;
- all standards were perceived to have the same weight rather than being categorised in order of importance or flexibility; and
- duplication and overlap in the approvals process introduced cost and delay.

67 Office of Rail Regulation (2010) *Report on the ORR's Review of RSSB*. London: ORR.
68 Office of Rail Regulation (2010) *Report on the ORR's Review of RSSB*. London: ORR

11.2.5 Principal issues

Lack of a system-wide approach

In light of concerns expressed about the lack of a system-wide approach, the industry needs to determine how this problem will be addressed and resolved, and how the industry puts in place a structure that works better.

The Study recognises that organisations such as the DfT, NR, the ORR and RSSB all have an interest in developing system-wide solutions. The Study also acknowledges that a wide range of cross-industry groups have been created to attempt to provide whole-system approaches on technical issues. Examples include the:

- Technical Strategy Leadership Group;
- Reliability Steering Group;
- Systems Interface Committees;
- Sustainable Development Steering Group;
- Operations Focus Group; and
- Community Safety Steering Group.

The Study found that most of these bodies were consultative and possessed little authority so that progress on sensible ideas was slow. They found it hard to resist idea blockers who failed to take a whole-system approach in their thinking.

The Study is also aware that the trend to decentralisation will rightly place additional responsibility and decision-making at the local level, which could make the handling of system-wide issues more difficult. The industry needs a structure that can deal with such issues. The Study notes the comment by ATOC:

> "*There will still be important functions which need to be provided at a network-wide level some of which are currently carried out by NR.*
>
> *[ATOC] believe these functions should migrate to a new and lean central systems body whose executive would retain the best of the current significant skilled resources in the industry, including NR, devoted to such tasks.*"[69]

The industry needs to determine how to establish a more decentralised railway while at the same time managing national and system-wide issues more effectively than now.

Standards

The Study found that there was widespread consensus that some company standards, especially design standards, were complex, confusing, contradictory and, some said, not fit for purpose.

The Study noted the comment made by the ORR in its review of RSSB:

> "*The overall strategy for standards in the industry is likely to need to change to enable improved efficiency and meet EU requirements.*"[70]

69 ATOC (2011) *A New Structure for Success on Britain's Railway.* London: ATOC.
70 Office of Rail Regulation (2010) *Report on the ORR's Review of RSSB.* London: ORR.

The principal issue on standards is to assess how to:

- make them simpler to understand;
- ensure that the number of standards is minimised;
- provide the right level of prescription and flexibility;
- ensure there is an efficient system to manage derogations and change; and
- reflect the fact that one size does not fit all.

The Study recognises that there are potentially conflicting views on the way to develop standards. On the one hand, creating a common, unified set of standards, while a potentially lengthy process, could be effective in dealing with the reported complexity, contradictions and risk aversion that currently exist. A common approach could expand the supply market and enable enhanced contestability.

On the other hand, a completely uniform approach to standards would fail to exploit opportunities where bespoke and simplified standards could reduce costs. Standards that are appropriate for routes used by 125mph passenger services or 4,000 tonne freight trains are excessive and too expensive for a low usage railway.

In response to the particular concerns that have been raised about the cost of the low-use network, the Study investigated the standards and other issues relating to signalling, track maintenance and renewal, stations and rolling stock on this type of railway. Each one of these was regarded as needing challenge and, as a result, the Study has commented on the value for money opportunities from implementing a lower-cost regional railway.

11.2.6 Recommendations for cost reduction

Achieving a system-wide approach

A radically more effective approach to system-wide problems is needed. Tinkering with the existing, multi-organisational, silo-based approach will be insufficient.

The Study observes that the industry fails to engage fundamentally on system-wide issues despite the endeavours of cross-industry bodies such as RSSB or committees such as TSLG. This lack of engagement is highlighted, by way of example, in the ORR's review of RSSB. The ORR recommended a significant change in the composition of the Board of the RSSB to achieve greater representation from the industry. In the same document the ORR reported that, in answering a question regarding how RSSB could support and facilitate leadership in the industry:

> *"Respondents … recognised that greater engagement from the industry was required than at present."*[71]

The lack of sufficient industry engagement with RSSB is also observed in other parts of the ORR's report and the Study has found this is symptomatic of a lack of consistent and high-level involvement by the industry with other industry bodies attempting to tackle system-wide issues.

To correct the failings of engagement, the problems of silo-thinking and the lack of a whole-system approach, the Study recommends the creation of a Rail Systems Agency (RSA) to lead on system-wide issues.

71 Office of Rail Regulation (2010) *Report on the ORR's Review of RSSB*. London: ORR.

The RSA would work with the industry to improve value for money for the industry's users and funders by optimising the performance of the whole railway system – now and in the future. Its focus would be on activities and decisions that affect those interfaces that exist on a system-wide basis. It would not act or interfere in decisions of a purely local nature or those that were managed within a single company or organisation. The industry would need to engage in a meaningful way in tackling system-wide issues.

The implementation of the RSA would mean changes to existing organisations and would involve the transfer of responsibilities from:

- the DfT's Rail Technical and Professional division;
- NR's professional and technical organisation;
- RSSB; and
- the technical functions of the ORR and ATOC.

By combining the activities of the donating organisations, the Study believes the RSA would be more effective in addressing system-wide issues than those organisations can hope to be on a standalone basis.

The timing and exact nature of the changes to existing structures would be for the industry, through the Rail Delivery Group, to decide, but the Study believes the changes could be achieved during Control Period 4 (CP4). The remit and the scope of the RSA's activities would also be for the industry, through the Rail Delivery Group, to determine, but the Study proposes that it embraces the following range of responsibilities:

- identifying new operating practices or technologies employed in other railways, transport modes or industries that would improve value for money in the industry;
- monitoring, analysing and reporting on overall system safety performance and responding to system-wide safety recommendations;
- undertaking planning and appraisal around system-wide technological initiatives and taking on a system authority role for individual system-wide projects;
- representing the GB rail industry's interests in interfacing with technical, safety and standards issues in Europe;
- developing, implementing and administering simple, effective and low-cost approvals and accreditation processes;
- tackling system-wide issues that have significant potential for delivering value for money, including:
  - the introduction of more "track-friendly" trains;
  - developing a system-wide approach to information systems;
  - encouraging reduction in train weight; and
  - accelerating the introduction of new signalling technology;
- management and development of standards in the GB rail industry as identified in the Study's recommendations on standards;

- hosting of the Rail Innovation and Growth Team (RIGT) that the Study proposes as the mechanism to drive a new approach to innovation in the GB rail industry and which is explained in the section on innovation (Section 11.3); and
- driving improvement in the industry's Information Systems (IS) capability where the Study has identified a number of problems with existing national IS architecture and an inability to exploit new technologies and systems.

The RSA would seek to make progress through consensus, but with the ability to impose a solution with demonstrable system-wide benefits after a sufficient period of debate and with mechanisms to compensate any parties who would suffer significant financial detriment. It would consult with the industry in accordance with regulatory best-practice, and its decisions would be open to challenge and appeal through a defined, but time-limited, process.

The Study expects that the industry would want to engage with the RSA on a voluntary basis, but industry parties would also be obliged by licence condition to be members and to have regard for the activities and decisions of the RSA. The RSA would be funded by industry.

The RSA would be regulated by the ORR and tested to ensure that it was meeting the objectives set for the RSA by the Rail Delivery Group.

Standards

The RSA would be the focal point for tackling the standards issues that have emerged. This would be achieved by leading the development of common standards that build on RSSB's work in the management of Railway Group Standards and taking responsibility for selected NR company standards. This process would identify those standards that were no longer required to operate a value for money railway.

For those standards that remained, a comprehensive review would grade them into three categories:

- red – those that were mandatory and not subject to derogation;
- amber – those that, while mandatory, could be subject to derogations and amendment; and
- green – those that represented best practice, but were not compulsory.

Standards that facilitated low-cost methods of operation on the differentiated network would be identified and implemented.

The existing initiative to implement a new approach to the Rule Book would continue.

The RSA would ensure that industry processes for product acceptance, standards change and derogations operated efficiently and fairly. Its role in managing standards would also allow it to assume responsibility of being the champion for Great Britain on the TSIs and other technical issues emanating from the EU. To give effect to this national role, the RSA would also have to take on responsibility for the standards applying to other GB rail infrastructure.

11.2.7 Potential for, and timings of, cost savings

The Study has assessed the benefits from changes in approach to system-wide issues, including a revised process for managing standards. Savings have been identified by evaluating the effect of applying new practices to current and future projects, as well as bringing a sharper focus to a range of industry initiatives that would benefit from a greater engagement by the industry.

The Study forecasts net expenditure savings of £190m in 2018/19.

To enable these savings to be achieved, there would be a requirement for one-off expenditure relating to organisational change, resourcing a standards review and initiating a campaign for continuous safety improvement.

11.2.8 Implementation plan

The Study believes that change can be implemented quickly in this area.

Quarter 3, 2011

A team or task force, drawn from the organisations that will pass responsibilities to the RSA, should be created immediately, tasked with designing and implementing the new organisation. One option for early implementation would be through the building of competencies around the setting-up of a technical Designated Body that will be created as part of the transposition of the Interoperability Directive.

Quarter 4, 2011

The structure of the RSA would be finalised and a transition plan from the various bodies passing responsibilities to the RSA would be agreed. Establishing management processes, especially around funding, expenditure and budgetary responsibility, would take place. The need for ongoing work to continue would be reinforced. The formal review of industry standards would be launched.

Quarter 2, 2012

The new structure would be launched either as a single event or as a phased migration. There would be a fixed date on which the formal transfer of powers and responsibilities took place.

Rest of 2012 and 2013

The organisation would be embedded in the industry and progress monitored.

11.3 Innovation

11.3.1 Description of studies and analysis

A common theme across all the areas of research undertaken by the Study was that improving innovation in the rail industry would reduce its costs. There was a widespread recognition that, in terms of innovation, the GB rail industry lagged behind other railways, other transport modes and other industries. The Technology Strategy Leadership Group (TSLG) has commissioned work on this subject, while NR has put in place a major programme to encourage innovation.

The Study reviewed the various initiatives and ensured that key players in innovation were involved in the Area G Stakeholder Group.

11.3.2 Evidence base

The principal source of information was the Atkins Global (Atkins) report *Achieving Value for Money from Improving the Management and Delivery of Innovation in the Industry*, commissioned by the Study (DfT ref. Study 10003; February 2011).

Other sources of information included:

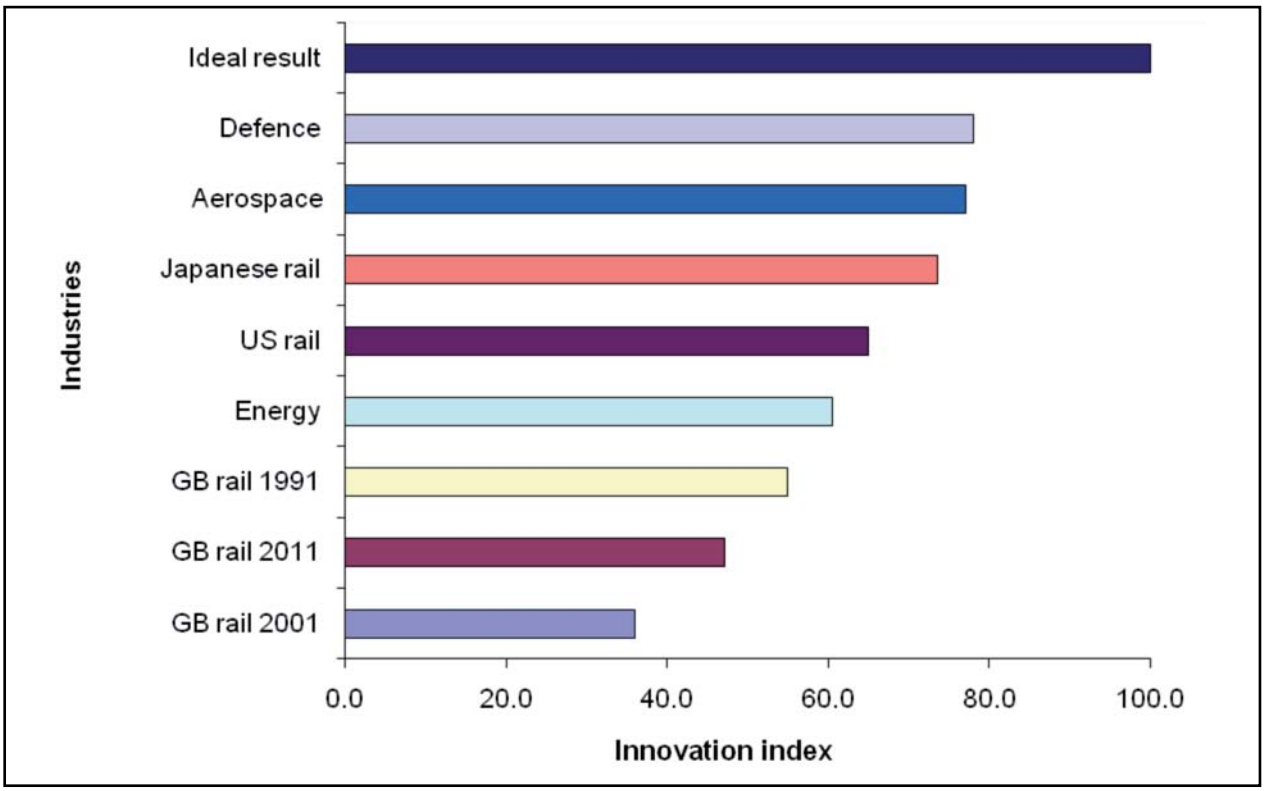
- AD Little (2010) *Enabling Technical Innovation in the Industry – Barriers and Solutions*, report to Technology Strategy Advisory Group (TSAG); and
- AD Little's research undertaken for the VfM Study *Achieving Value for Money in Safety, Standards and Innovation* (DfT contract number PPCA10046; September 2010).

The Study also consulted parties in the industry to obtain their views on innovation and received input from the Area G Stakeholder Group.

11.3.3 Background information and key data

To measure the effectiveness of research, development, testing and innovation in the GB rail industry, an Innovation Index was defined and developed into a model by Atkins. This was used to identify trends over the last 20 years and to assess where the Industry sits in comparison with other organisations. The conclusion, shown in Figure 11.5, was that innovation in the GB rail industry has improved over the last 10 years, but still lags behind other railways and other industries.

Figure 11.5: Comparative innovation index



Source: Atkins.

The Study also looked at innovation in other railways and other industries to help understand the techniques to improve innovation.

Japan

Innovation in the Japanese railway is driven by industry strategy and policy. Since the formation of the Railway Technical Research Institute (RTRI), innovation has taken a strategic position with a

holistic systems view to manage overall railway reliability. Institutions like RTRI, the Railway Technology Promotion Centre and four highly advanced testing facilities play pivotal roles in enabling innovation from basic research through to advance application development and standardisation.

USA

Innovation and R&D in the US transportation industry, including the railways, is largely driven by both national and industry strategy and policy and stakeholder needs. It has certain limitations, in particular its ability to address inter-modal transport R&D issues and the alignment of modal agencies towards the strategic goals of the US Department of Transportation.

Aerospace

Aerospace manufacturing is a particularly well-regarded sector for innovation. It is highly structured because of the long development cycle and asset life. Its innovation success comes from an ability to align the market drivers of the various participants. Innovation delivery capability is embedded directly into the manufacturing side, and strong industry structures have been put in place to encourage and manage innovation.

Energy

The energy generation and supply innovation system is focused on innovation drivers based on value for money and cashflow responding to pressure from regulators and internal competition. The areas for innovation are clear and incentivised by substantial regulatory penalties.

Defence

Owing to the network of UK military alliances, the defence industry is a leading exponent of the global market. It excels in capability transfer, even using resources and ideas from the video gaming industry.

11.3.4 Barriers to efficiency

The Study found that, overall, GB rail was underperforming in innovation because of poor behaviours, lack of a systemic perspective and difficulty in working across organisational boundaries, whether commercial, technical or managerial.

Specific problems affecting innovation in the GB rail industry were:

- industry fragmentation, which encourages silo thinking;
- the need for immediate returns, encouraged by short franchises, which deters investments in innovation that provides a long-term return;
- the absence of incentives to innovate;
- the lack of a structure to drive innovation across the industry in contrast to that seen in other railways and other industries;
- restrictive interpretation and application of standards undermines innovation; and
- the absence of up-to-date test facilities delays and deters development.

Although individual organisations within the industry have made significant investments in innovation capability, in most cases these have applied only to the organisation's own sphere of control. Benefits occurred beyond the innovating organisation only when the right leadership behaviours were present.

Despite shared technical priorities, as expressed through TSLG and the Rail Technical Strategy, incentives in the industry continue to be defined in ways that are contradictory to collaborative innovation. The incentives in a seven-year franchise do not align with the long life of rolling stock and other railway assets.

There are some instances of key groups of individuals at senior level exercising leadership and judgement to resolve conflicts and develop solutions, but this is the exception rather than the rule.

An external perspective was obtained from the Technology Strategy Board (TSB), which has a wider view of innovation across the UK. It commented on the rail industry's propensity to overindulge in bespoking and "gold plating", so that every idea is effectively treated as a niche idea and the benefits of capability platform development are overlooked.

11.3.5 Principal issues

The Study identified four issues that have to be addressed.

How to correct the lack of industry leadership

The lack of industry leadership, found in many areas of the Study's work, also applies to innovation. This contributes to the multiple channels of research pursued by the industry: strategic research under the DfT, RSSB's research, research by universities, work and initiatives by suppliers. While TSLG attempts to co-ordinate the industry approach to innovation, the Study found little evidence of practical support for system-wide innovation from the senior people in the industry.

How to overcome the misalignment of commercial benefits

The fragmented nature of the industry leads to a lack of motivation for individual players in the industry to innovate. Structural issues lead to commercial benefits being diminished or obscured, or to perceived high risks of failure. The absence of a single-systems view makes it impossible to see the complete set of cost and benefit trade-offs, or to manage these meaningfully. Industry structure problems, exemplified by short franchise periods and tightly constrained payback periods, mean that investment benefits cannot be realised and innovation is stifled as a result.

How to deal with the lack of collaborative behaviour

Silo thinking between, and within, organisations means that benefits may not be pursued if the beneficiary and the funder are different. People avoid innovating because they do not wish to manage the complexity and uncontrollable delays, which they believe will be put in their way by an industry with a poor track-record on innovation.

How to improve processes for introducing innovative products

The processes by which innovations are brought onto an operating railway are poorly understood and are a source of great risk to innovators. This undermines the motivation for innovation and the ability of the industry to exploit innovation. The risk of bringing a novel product or system into service is seen as a block to innovation. Some of these risks are attributed to acceptance processes

that are opaque and difficult to manage. Others are attributed to the uncertainties surrounding obtaining derogations from standards. The absence of GB test facilities is seen as a problem, exacerbated by difficulties in making effective use of test results and certification from other railways.

11.3.6 Recommendations for cost reduction

The Study recommends the creation of a leadership group to drive innovation in the industry, drawing on models that have been used in the aerospace and automotive sectors. This leadership group might be known as the Rail Innovation and Growth Team (RIGT). The RIGT would focus on encouraging industry parties to innovate by identifying technology opportunities and showing where and how those parties could obtain returns for their investment.

The RIGT would:

- research and highlight potential areas for innovation and match potential innovators with gaps in the market in areas such as information systems, retailing and rolling stock, while recognising that innovation is not just about new technology, but also relates to processes and business ideas;
- draw on best practice in the aerospace, automotive, defence and energy industries to overcome the current lack of meaningful collaboration within the industry;
- learn from other railways about encouraging innovation, using examples such as the Association of American Railroads;
- build on the existing R&D and innovation roles of the DfT, TSLG, NR and RSSB – the RIGT would be hosted by the RSA and be guided by the Rail Delivery Group;
- have a remit that covered the entire range of innovation from pure academic research through to product introduction, known as the Technical Readiness Level (TRL) cycle, and would bring together academic institutions, the operating railway and its suppliers;
- build on the current level of research funding contributed by Government via the RSSB and secure additional funding from industry and other Government sources to enable the construction of a serious innovation programme;
- define and establish clear and straightforward procedures for interacting and collaborating with other innovation enablers such as Technology Innovation Centres (TICs); and
- work with other parts of the Rail Systems Agency to improve the processes for introducing innovative products, including:
  - the development of modern test facilities;
  - the streamlining of approvals processes; and
  - removing or changing standards that discourage innovation.

11.3.7 Potential for, and timings of, cost savings

Before examining the potential cost savings for the industry, the Study acknowledges that a successful approach to innovation could open up a sizeable international rail market for the industry. If GB rail could capture just 5% of the mature and emerging rail markets in terms of innovation, then the annual export gain could be £0.8bn. While this does not have a direct impact

on the Study's cost-saving estimates, it should act as an incentive to industry to invest in innovation.

The project costs that the RIGT could manage would be between £55m and £140m. The TSB, which has a similar type of workload, manages about £90 of project cost for every £1 spent on staff.

Identifying potential cost savings for the industry is not simple. Historically, a high proportion of the ideas that start to be developed fail to deliver, while the occasional idea is turned into a world-beating export success.

The DfT estimate that the current total industry innovation spend is £50m. Of this, £16m was invested by rail industry suppliers. In its assessment of industry savings, the Study has excluded the investment made, and the returns obtained, by suppliers.

The returns on innovation investment in GB rail, based on discussions with the industry and a review of past project results, as well as present and future project expectations, have been estimated in the range of 1.5:1 to 3:1. A comparison of returns on innovation investment in other industries revealed a return ranging from 3:1 to 10:1.

The Study has assumed that the Government and rail industry would increase innovation funding from the current £34m to £75m by 2018/19. A conservative return of 3:1 would be achieved, and returns would take, on average, between three and five years to mature after the investment was made.

To assess the savings accruing solely to Government and industry, the Study has taken into account the phasing of potential innovations and projects, and the time it takes for innovation investment to create returns. This would increase the current net return on innovation investment from £50m (assuming a 1.5:1 return) to £200m (assuming a 3:1 return).

This investment would feed through to the industry as lower costs in the operations, maintenance and renewal of fixed and moving equipment. The Study anticipates that the forecast net expenditure savings in 2018/19 would be £100m.

The benefit could be greater if:

- additional innovation funding was put in place; or
- a return greater than 3:1 was assumed; or
- a quicker return than three to five years was achieved.

11.3.8 Implementation plan

This focuses on the development and creation of the RIGT, which, once operational, would lead and manage innovation at rail industry level in Britain.

The TSB, set up by the Government, might form a useful source of ideas on structure and process, as well as providing a conduit for wider innovation opportunities across the industry. TICs will support the practical drive to implement individual projects.

It is envisaged that the overall programme for setting up the RIGT from start-up to launch would be approximately one year and would be characterised by the following key stages for the programme.

Quarter 3, 2011

A core RIGT is put in place and initial terms of reference agreed by the Rail Delivery Group.

Quarter 4, 2011, and Quarter 1, 2012

The RIGT organisational build phase takes place, drawing on innovation advocates and experts from within the GB rail industry and from other industries.

Quarter 2, 2012

The RIGT would be launched and would bring together the key industry players in creating a system-wide approach to innovation.

Quarter 3, 2012 onwards

To understand the RIGT's performance, and the impact it has had on innovation in the rail sector, would require an evaluation process to be implemented during this period.

12. Area H – People

12.1 People

12.1.1 Description of studies and analysis

The industry's people have played a key part in the achievements of recent years and are fundamental to the industry's future success. However, staff represent a major cost element in the industry, approaching £4bn a year and this area cannot be immune from the changes that the industry has to make if it is to provide a value for money service to its users, funders and the taxpayer.

The Study has considered a wide range of material and consulted with many industry parties to obtain opinions and views on the best ways to achieve value for money from people in the rail industry.

The Study was also pleased to receive input from the Area H Stakeholder Group comprising senior industry managers responsible for a significant proportion of the industry's workforce.

12.1.2 Evidence base

The Study engaged external advisers to review specific topics and a team from the rail industry considered terms of employment, train operating, retail, stations, infrastructure staff, overheads, administration and Human Resources issues.

The Studies commissioned for Area H were:

- AECOM in partnership with the University of Leeds (Institute of Transport Studies) and First Class Partnerships (November 2010) *Achieving Value for Money from People in the Rail Industry*;
- AECOM (2011) *Further Research*;
- Peter Thompson, FIA (March 2011) *Review of Pensions for the Department for Transport (DfT)/ the ORR Rail Value for Money Study*;
- AECOM (2011) *Rail Value for Money Study: British Transport Police Review*; and
- Adventis (2011) *Resource Efficiency Report for the ORR and DfT's Rail Value for Money Study*.

A range of external documentation has been consulted, including:

- the statutory accounts published by various industry parties;
- *Pension Commission Report* and the accounts of the Railway Pension Scheme;
- the accounts of the British Transport Police and British Transport Police Authority;
- National Passenger Surveys;
- franchise agreements;
- terms of employment;

- the websites of industry parties such as the trade unions and the Association of Train Operating Companies (ATOC); and
- guidance and standards issued by industry bodies, such as the Rail Safety and Standards Board (RSSB).

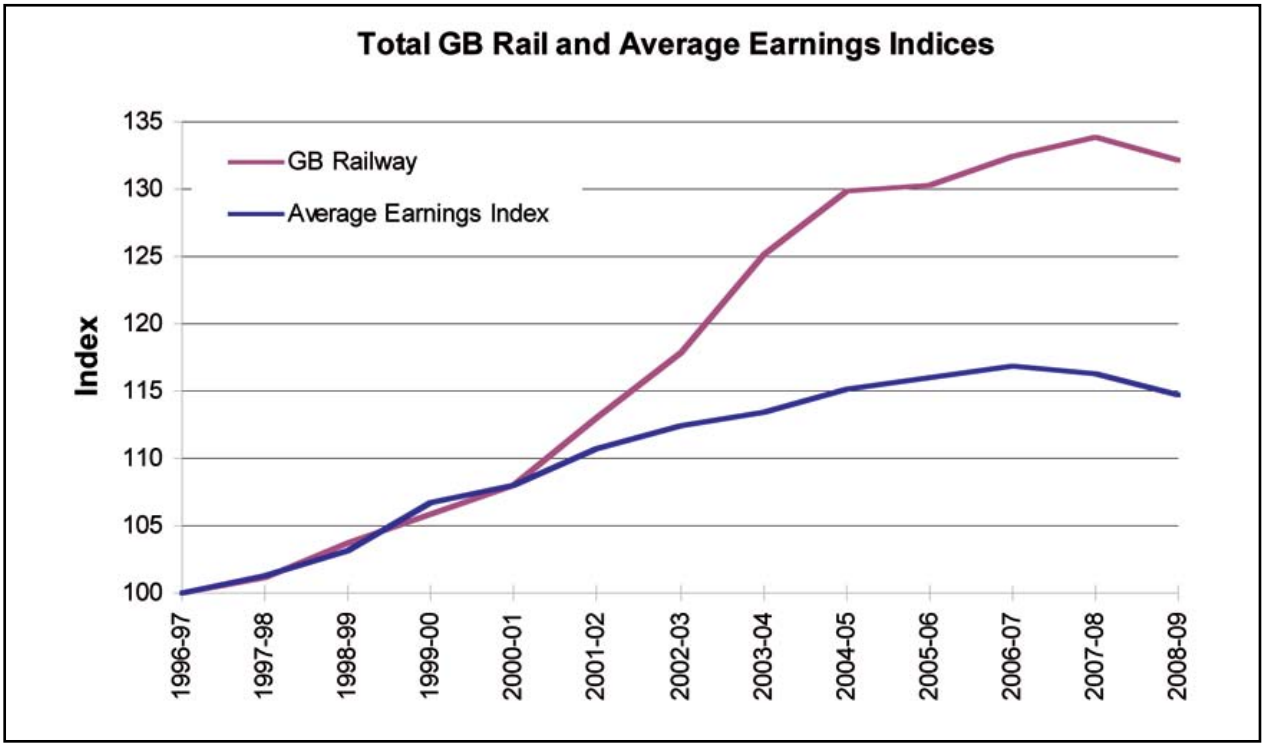
12.1.3 Background information and key data

The Study's research has identified that employee numbers in the GB rail industry have risen from 81,000 in 1996/97 to 92,000 employees in 2008/09 (Network Rail (NR), Train Operating Companies (TOCs), Freight Operating Companies (FOCs) and Open Access Operators (OAOs)). Staff costs (at 2008/09 prices) have risen from £2.56bn to £3.85bn per annum. The Study has focused on these costs, but it is recognised that there are also significant additional employee costs in the wider rail supply industry.

Earnings

Average earnings for the GB rail industry have grown faster than earnings for the economy as a whole, as shown in Figure 12.1.

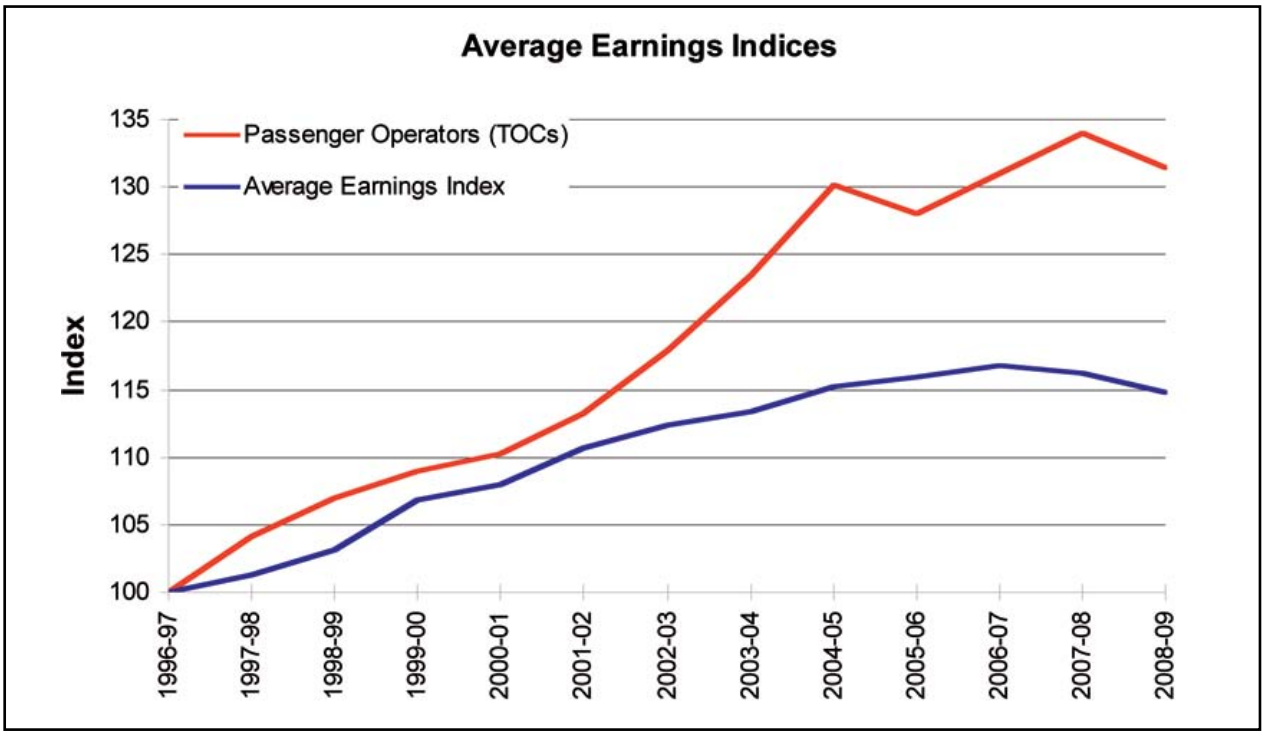
Figure 12.1: Average earnings compared with all GB rail average earnings



Source: Study.

From 1996/97 to 2008/09, TOC real average salary costs increased by 31% compared with 15% growth in real average earnings for the economy as a whole. ATOC recognises this as an issue and was quoted in the *Financial Times* in February 2011: "*It should be a feature of longer franchises and franchise reform that they are incentivised to do a better job of containing labour costs in future*." Figure 12. 2 shows growth in average earnings for TOCs.

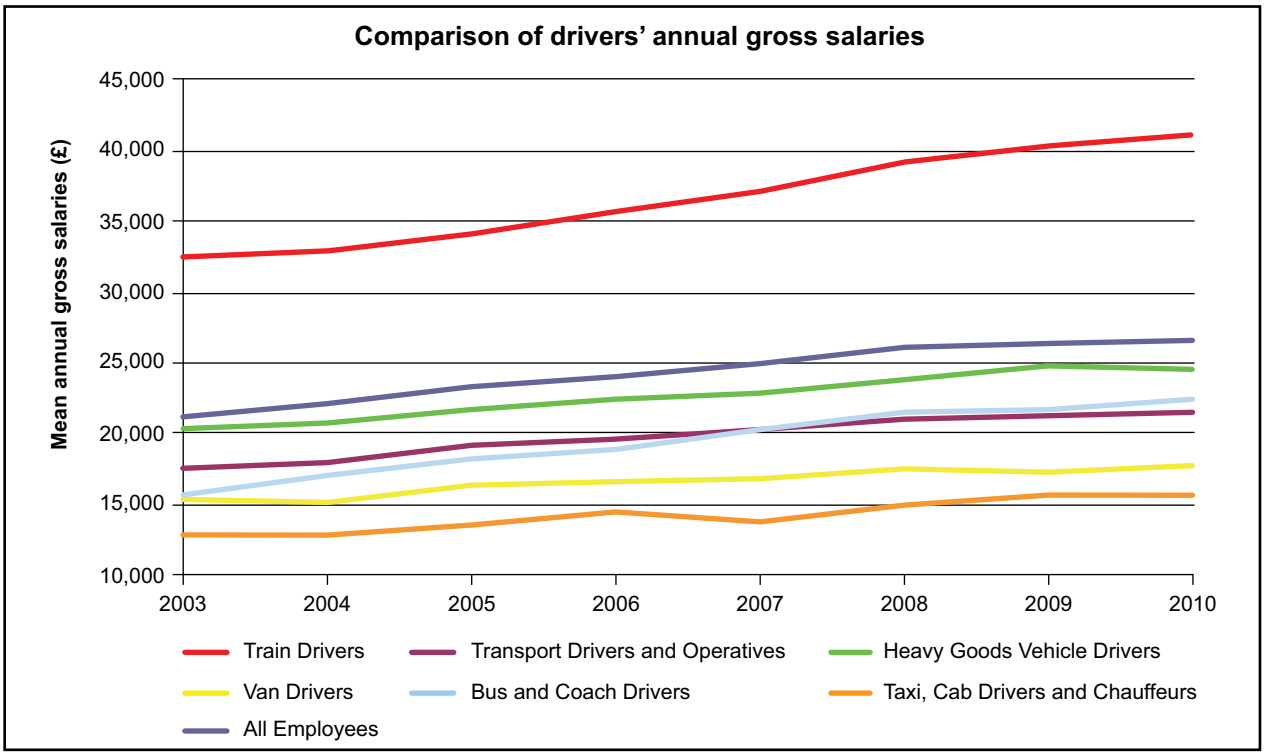
Figure 12.2: Average earnings compared with TOC average earnings



Source: AECOM.

Comparisons with other transport modes in the UK have shown that salary levels, for comparable occupations, are higher in rail for groups such as drivers, as shown in Figure 12.3. For other groups of staff, salaries have also been above other comparable jobs, but closer to average earnings.

Figure 12.3: Comparison of driver salaries in different transport modes



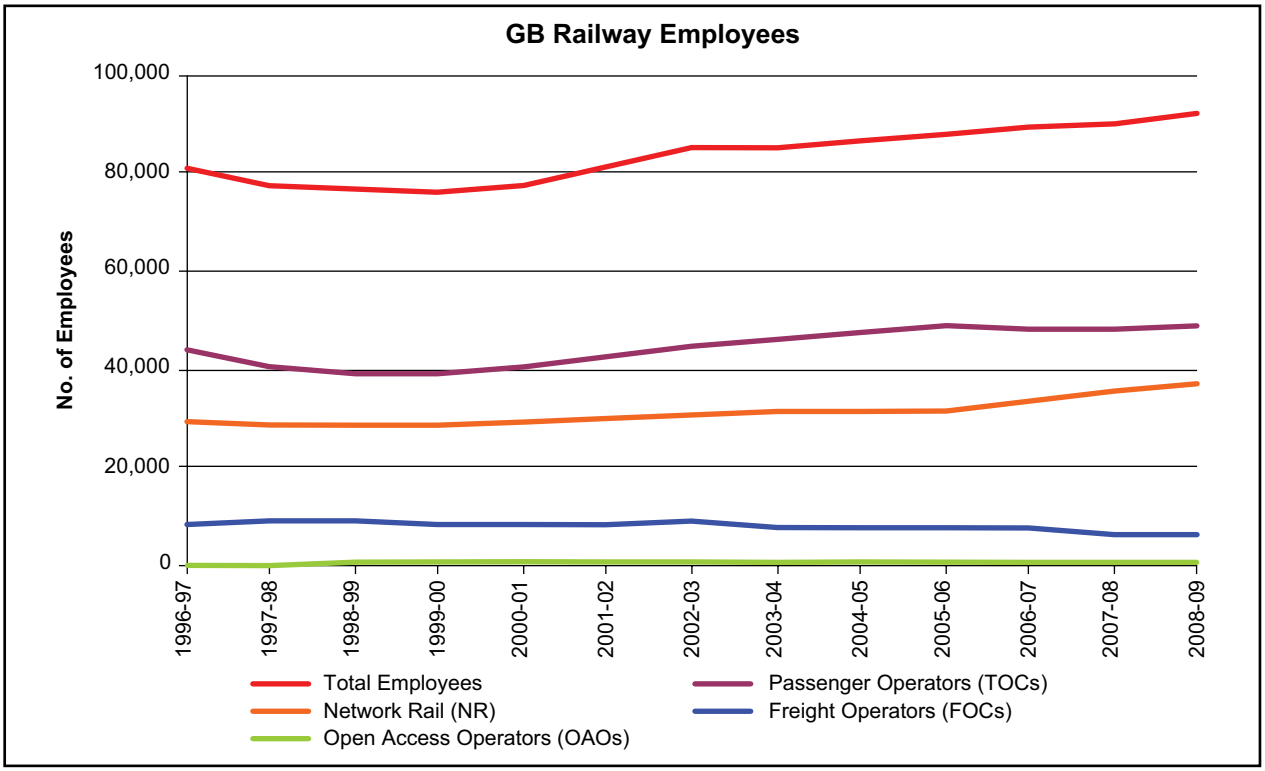
Source: AECOM 2011 (from Annual Survey of Hours and Earnings (ASHE).

Headcount

Overall staff numbers have increased since the mid-1990s, although structural changes relating to the employment of infrastructure maintenance staff distort the tracking of trends during the period 2002–06.

Since 1999/00 increases in staff numbers have outstripped growth in train-km, thus causing labour productivity to fall over this period (1999/00 to 2008/09) after some initial gains in the early years following privatisation. Figure 12.4 shows the total number of employees employed by NR (and Railtrack), TOCs, FOCs and OAOs.

Figure 12.4: People employed by NR, Railtrack, TOCs, FOCs and OAOs



Note: NR figures prior to 2005/06 have been uplifted to include maintenance staff that were employed by other companies.

The trends in Railtrack's and NR's staff numbers (currently 34,900) were affected by the decision to bring all maintenance activity in-house, but the Study established that most NR staff categories have stayed fairly static or declined over the last three years. The exceptions are in Asset Management and the National Delivery Service (NDS). The largest employment group in NR is maintenance staff, accounting for nearly 50% of total staff.

TOC staff numbers (currently around 49,500) declined in the initial period after privatisation. This was followed by a period of prolonged growth in staff numbers, although in the last year most TOCs have reduced their headcount.

FOC staff numbers have fallen by 30% since the mid-1990s despite growth of 47% in tonne kilometres during that period. Although the Study has not examined the FOCs in detail, the Study is aware of substantial efficiencies achieved by the FOCs in a competitive market, a matter that is further examined in the Study's review of freight.

International

International comparisons rely on the availability of information on a consistent basis. The Study has undertaken comparisons with other European railways on wage growth, overall wage levels and productivity. In 2006/07, overall GB railway wage levels were, on average, 20% higher than in Sweden and Germany, but lower than in the Netherlands, as shown in Table 12.1.

Table 12.1: Comparisons of earnings in 2006/07 between Britain, the Netherlands, Sweden and Germany

Country	Number of companies	Average salaries		
		All full-time employees (FTEs) €000s	Management/ admin FTEs €000s	Non-management/ admin FTEs €000s
Britain	30	50	73	46
Sweden	12	41	52	35
Netherlands	2	67	N/A	N/A
Germany	17	43	63	40

Source: AECOM 2010 (from Rico Merkert and others).

In contrast, Civity management consultants[72] found that TOC staff costs were lower than state-owned European comparators, but drew out that the salaries in privately-owned railway companies in mainland Europe are also lower than those of the state-owned companies.

UK productivity (as measured by train-km per employee) has been deteriorating and is now below the Netherlands, Spain and Switzerland as shown in Table 12.2.

72 Civity (2011) *International Whole-industry Including Train Operating Cost Benchmarking: Final report to the Rail Value for Money Study.*

Table 12.2: Train-km per employee compared with mainland European countries

Country	2006 train-km per employee	2006 rank	2009 train-km per employee	2009 rank
Netherlands	4,457	4	8,261	1
Spain	5,969	3	6,315	2
Switzerland	6,285	1	5,903	3
UK	6,124	2	5,749	4
Germany	3,957	5	3,627	5
Italy	3,464	6	3,534	6
France	2,999	8	3,264	7
Austria	3,033	7	3,228	8
Czech Republic	2,493	9	3,102	9
Poland	1,567	10	1,523	10

Source: AECOM, 2011 (from UIC 2006 and 2009).

Overheads

The Study has established that TOC overhead staff numbers (excluding people directly involved with day-to-day operations) are, on average, 5% of total staff numbers, within a range of 3% to 11%.

Overhead classification of NR's staff can be defined in various ways. The Study estimates that between 18% and 25% of NR's staff could be categorised as overheads.

Administration

The industry has a number of administrative bodies, trade associations, interest groups and regulatory authorities. In its review the Study has not included bodies that have:

- been set up on a voluntary basis to represent particular interest groups;
- a limited number of employees;
- primary responsibility for separate transport systems such as London Underground; or
- responsibility for transport procurement at local level.

On this basis the principal administrative bodies are shown in Table 12.3.

Table 12.3: Rail industry administrative bodies

Organisation	Annual budget £ (m) (from reports or estimated)	Staff numbers	Staff costs (£m) (from reports or estimated)	Source
DfT	32 (estimate)	314	18	DfT intranet website
ORR (including HM Railway Inspectorate)	32	304	18	Annual Report 2010
Passenger Focus	8	70	4	2009–12 Corporate Plan and website
ATOC (including IS companies)	54	139	8	Annual Report and Accounts 2010
RAIB	5	52	3	2010 Annual Report
BRBR	3	36	1	Annual Report
RSSB	See Section 11			
Transport Scotland	4 (estimate)	96	3	2010 Annual Report
TOTAL	138 (part estimate)	1,011	55 (part estimate)	

Source: Study.

12.1.4 Barriers to efficiency

Franchising

The franchising model is not conducive to tackling costs. One of the principal problems is the absence of effective mechanisms that enable the franchisees to secure a return on investments made during the course of a franchise.

Achieving value for money from people is no different from any other area of franchising. Making investment in new retail channels, on-train equipment or other investment that allows staff to be redeployed to more value-adding activities needs to have a demonstrable return.

An additional challenge for franchisees is the contractual relationship with Governments and other stakeholders that constrain their room for manoeuvre in responding to changes in the external environment. One example is the Ticketing and Settlement Agreement (TSA) between the DfT and

franchisees, which prescribes such matters as ticket office opening hours. The TSA affects the TOCs' ability to react to changing circumstances in demand or emerging trends in retail channels.

Franchising contracts also contain a rigorous set of requirements relating to the management of the TOC, with draconian penalties for failure to comply. This has often inhibited the TOC community from tackling historic problems around workforce productivity and flexibility. The lack of a common understanding between Government and franchisees on the need for change needs to be overcome in the new industry environment.

Industry structure

The structure and behaviours of the industry encourage individual companies to work in silos and to have minimal regard for overall system benefits. This applies to the management of people as much as any other area of activity. This leads to the duplication of activities that could be done better in a single place, if industry members were able to trust other parties to deliver their requirements. Areas such as operational control, information systems provision and industry planning all fall into this category. This lack of trust is also evidenced by the man-marking between organisations, which leads to excessive overhead cost. This applies to relationships between the administrative bodies and the operating and infrastructure companies, as well as between those companies.

Management of the industry's people

It is widely recognised that the industry has historically had a somewhat adversarial approach to employee relations and this has been a further barrier to efficiency. The rail industry is strongly unionised and, although this is not in itself a barrier to efficiency, it does create a heavily structured environment for making progress on people issues. The industry has very complicated and extensive terms of employment, with marked differences between different groups of staff and between different employers.

Making changes to these terms of employment is a cumbersome process for employees, employee representatives and employers, and creates significant cost for the trade unions and employers in acquiring and retaining knowledge of the intricacies of the rail industry's approach to industrial relations.

The recommendations made by the Study would inevitably lead to significant changes for the people in the rail industry. The delivery of these changes will depend on engagement by all industry players with their staff and their representatives.

Technical limitations

The GB rail network has a mixture of modern and historic infrastructure, signalling systems, stations and rolling stock. Much of Britain's railway heritage dates from an era before modern technology changed the face of post-war industrial Britain, although in the last 15 years there have been significant changes to the industry's asset base. State-of-the-art signalling centres have opened and are responsible for signalling over long distances. Modern stations on, for example, the Docklands Light Railway provide clear sight lines and high-quality passenger information. High-output track machinery can maintain and renew many miles of track, while new rolling stock is provided with modern communication and information systems.

New technology will move the railway even further into the twenty-first century. Secure radio will provide constant communication between the signalling centre and the train, while advances in

on-train communication will allow the driver sole control of the operation of the train. Cab-based signalling will continue the trend towards the eventual automated operation of trains. The advent of electronic, mobile and Smart ticketing will move the industry from cardboard to electronic authority to travel, while the exponential growth in internet purchasing will alter the relationship between customer and service provider.

Yet substantial parts of the rail industry still operate in a very traditional manner. There are over 500 mechanical signal boxes controlling trains over very limited geographical areas. In other locations, infrastructure is still inspected by the human eye and maintained by manual rather than mechanical intervention. Station buildings, representative of Britain's railway heritage, need considerable maintenance. Older rolling stock has very basic communication systems and is equipped with "slam" rather than power-operated doors.

12.1.5 Principal issues

On-train staff

The Study has reviewed the number and cost to the industry of the second member of the train crew employed by most TOCs – known as guards, conductors or train managers – of which there are 6,800.

Guards are not deployed on all train services. Those without a guard are known as Driver Only Operation (DOO) services. These include most commuter services in London and Glasgow, freight services and trains that are running without passengers. London Underground also operates without guards.

Trains operated solely by the driver constitute 30% of the services on the network. New services being introduced, such as the Javelin service on the High-Speed Line, the East London Line and the Airdrie–Bathgate route, are operating under DOO conditions. New projects such as Thameslink and Crossrail are also planned to operate as DOO services.

The primary responsibilities of guards are the opening and closing of train doors and train dispatch. They also have limited operational responsibilities in the event of an incident, although on DOO services these duties are perfectly adequately encompassed by the driver. On some routes, especially over long distances, guards may be involved in revenue collection and protection, although less than 5% of total ticket revenue is collected on the train.

On DOO services the driver opens and closes the doors aided by cameras on the train or by cameras and mirrors on platforms. The driver must be able to see the whole train – on curved platforms a camera and screen, or station dispatch staff are required. The driver must also be able to communicate with the signaller from the cab of the train.

The Study has considered how the operational staffing of trains can better reflect the needs of the industry.

Retail

There are over 2,500 stations on the GB rail network categorised from A, which are the largest stations and regarded as national hubs through to F, which are the smallest, unstaffed, stations. Categorisation depends on size, facilities and usage. Fifty-three per cent of stations are staffed.

Around 5,500 staff work on retail activities, of which 37% (approximately 2,000 people) are employed at small- and medium-sized stations.

The Study has found that the provision of retail staff is disproportionate to activity. Smaller stations account for 24% of passenger footfall. Retail productivity is lower at smaller stations, with approximately 3.5 staff per million passengers compared with 1.5 at Category A stations. At smaller stations retail staffing is largely driven by the contracted opening hours of ticket offices, whereas at larger stations sales volume is such that resourcing can be better matched to demand.

At smaller stations the majority of ticket sales take place in a three-hour period between 07:00 and 10:00, but many ticket offices are open much longer. Category D station ticket offices are open for an average of almost 13 hours on weekdays and category E for 10 hours. TOCs do not have the freedom to change opening hours as these are contractually fixed by the TSA. Opening hours can only be changed with DfT approval, which historically has been granted on only rare occasions.

The industry has been slow to exploit the benefits of developments in retail technology compared with sectors such as retail and banking. Ticket vending machine (TVM) technology is developing with a focus on simplicity and speed of use, and the proportion of sales through self-service machines grew from 10% to 17% between 2006/07 and mid-2010. The advent of internet-based retail is also changing the face of retail on rail. Combined internet and call centre sales rose from 10% in 2006/07 to just over 16% in mid-2010.

The use of Oyster Smartcard technology in London has demonstrated that a high volume transport network can move on from a piece of cardboard as the authority to travel. E-ticket/print-at-home, used by the airline industry, is gaining a hold in the rail industry, while m-ticketing, with the authority to travel carried on a mobile/handheld device, is also penetrating the market, reflecting expansion in the wider retail sector.

It has been argued that the staffing of ticket offices affects perceptions of personal security. The Study regards value for money in retail and security as separate issues. Passenger Focus research shows that customer concerns over safety and security increase after 20:00 hours. This may be a reflection of societal concern generally about security during the evening hours rather than being transport, rail or station specific. There is no evidence from National Passenger Survey data that TOCs with the latest closing times for ticket office achieve higher customer satisfaction in respect of station security.

The Study has considered how to ensure that the opening of ticket offices reflects demand and changes in retail channels and technology.

Stations

Excluding those involved solely in retail, a further 5,500 staff work on stations on the platforms or elsewhere in the station environment. Their primary responsibility is dispatching trains. Data produced by RSSB,[73] shown in Table 12.4, estimated the proportion of trains and passengers dispatched by station staff from a sample containing the majority of TOCs.

73 Rail Safety and Standards Board (2008) *A Review of Passenger Train Dispatch from Stations*. London: RSSB.

Table 12.4: Analysis of station dispatch

Dispatch method	% of trains	% of passengers
Driver only (DOO) self-dispatch	25	28
Driver and conductor self-dispatch	55	39
Total self-dispatch	**80**	**67**
DOO dispatch by platform staff	5	10
Driver and conductor trains dispatched by platform staff	15	23
Total platform dispatch	**20**	**33**

Source: RSSB.

The key message from this research is that 80% of trains containing 67% of passengers are dispatched without the involvement of station staff. The remaining 20% of trains are dispatched by staff employed on station duties.

TOCs will follow the general requirements set out in the Railway and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS), and base their choice of dispatch method on a risk assessment, taking account of relevant issues at the station. They will also take account of commercial issues, such as operating performance, customer service and the provision of information.

The Study has reviewed how to better match the availability of station staff to the demand for their services.

Salaries and terms of employment

Salaries in the industry have grown faster than average earnings, while certain salaries have risen at rates in excess of inflation. The Study has also identified that some salaries are higher than those found in comparative employment.

The Study has found that average salaries among passenger TOCs have increased from £29k in 1996/07 to £39k in 2008/09. The highest salary increases occurred in operations staff, a category dominated by drivers. The increase in average earnings (at 2008/09 prices) between 1996/97 and 2007/08 is shown in Table 12.5.

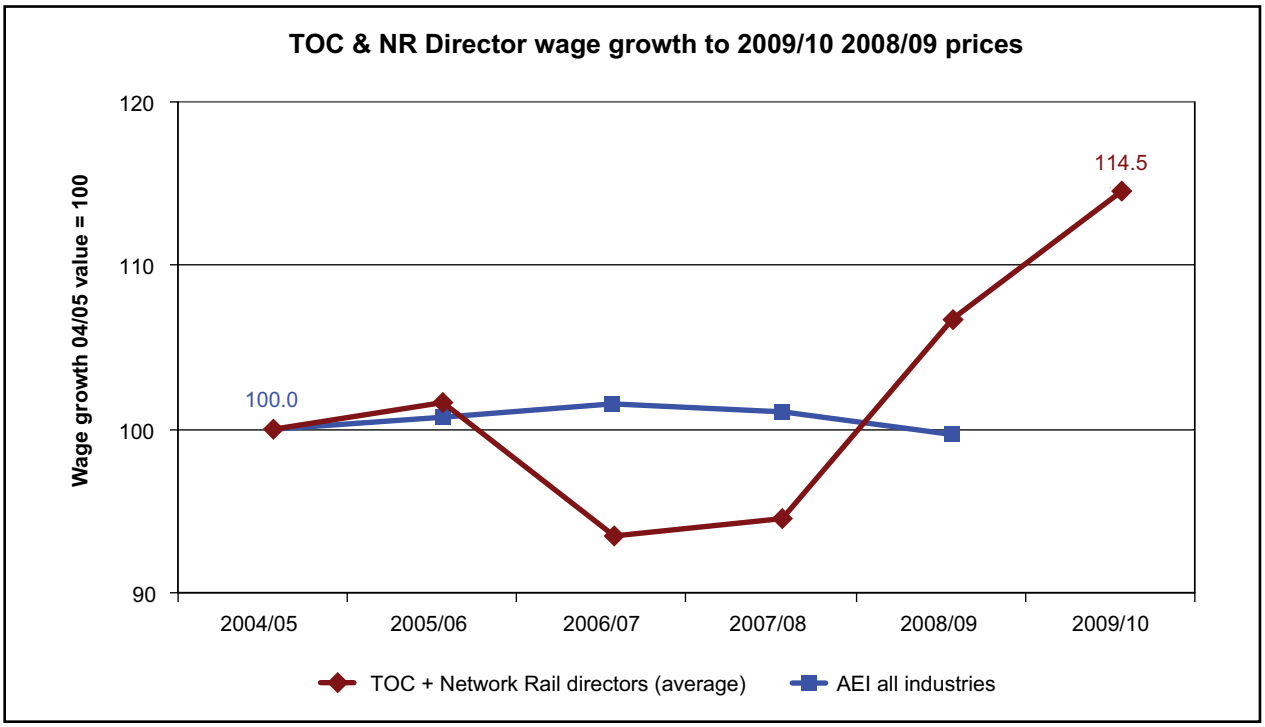
Table 12.5: Average earnings index passenger TOCs

Average earnings indices	1996/97	2007/08
UK industry average earnings	100	116
Rail industry average earnings		
Long distance TOCs	100	140
LSE TOCs	100	126
Regional TOCs	100	131
All TOCs	100	134

Source: AECOM.

The earnings of the industry's leaders have also moved ahead of average earnings and inflation. From a 2004/05 base, and at 2008/09 prices, the Study has calculated the trend in Directors' pay as shown in Figure 12.5. The Study reviewed the Statutory Accounts of 80% of the TOCs, three FOCs and NR. The Study found that Directors' pay fell initially, influenced by the deferral of bonuses, but in the last two years has risen rapidly and is now 14.5% higher than in 2004/05 at constant prices.

Figure 12.5: Comparison of GB rail director and UK average earnings



Source: Study analysis.

The Study has found that terms of employment are extremely varied and detailed. The complexity of terms of employment is demonstrated by one TOC that has 10 separate agreements governing the terms of employment of drivers, conductors, station staff and engineering staff. Some

agreements contain more than 300 pages and contain conditions that refer back to agreements made in the 1920s. The Study understands that this is common among many TOCs.

Operating within these agreements requires extensive and detailed knowledge by employers and employee representatives. Terms and salaries vary between TOCs, each of whom consults and negotiates changes individually with its trade unions.

The terms of employment have a strong influence on the utilisation of people in the industry, which will vary between job types and locations. The terms of employment do not always recognise that the industry operates seven days a week and contain within them constraints on flexibility and productivity. It is not unusual, for example, for drivers to be undertaking actual driving duties for less than 50% of the time that they are available to work because of agreements relating to rest breaks, train preparation and work schedules.

A particular issue that affects terms of employment is the industry's overtime culture, on which employers and employees rely. The expectation from employees that overtime will be available, and from employers that it will be worked, undermines the ability of the industry to establish stable terms of employment.

Until early 2011 NR was working with over 70 different sets of terms of employment and hundreds of variable job descriptions after bringing infrastructure maintenance in-house. Many of the working practices were inherited from former infrastructure maintenance companies who had restructured old British Rail terms and conditions. NR has recently undertaken a programme to rationalise these terms of employment. The consequences of these changes and the alterations in staff numbers are incorporated in NR's committed plans.

The principal issue is how to ensure that all the people in the modern rail industry have salaries and terms of employment that reflect:

- comparability with jobs of a similar nature;
- availability of new technology that changes the way that work is done;
- the need for flexibility in the way that staff are deployed;
- the need for staff to improve their knowledge and competence; and
- recognition that limitations on productivity undermine the industry's value for money.

Use of information technology in planning and allocating work

Information technology is not exploited fully in planning and allocating work. Operating the railway is a complex activity that requires the rolling stock, train crew and space on the network to be brought together to operate the timetabled service. Limitations on the capability of rolling stock create some constraints on resource usage, as do imbalances in demand, particularly for commuter services.

Further complexity is caused by the various constraints in the deployment of human resources which may be time based (length of shift, availability for work, other demands on time during the working day) or knowledge based (experience of types of rolling stock or understanding the characteristics of particular routes).

The production of work schedules and the allocation of staff to those schedules were historically undertaken through paper-based systems supplemented by human knowledge. The industry is now, somewhat belatedly, adopting information technology to undertake these processes, but is not

using the technology consistently or effectively, and the Study has considered how to use work-planning technology more effectively throughout the industry.

NR operations and maintenance

NR is the industry's largest single employer. Improving value for money from the people involved in the operation and maintenance of the network is a subject that receives close scrutiny during the ORR's Periodic Review process and is already reflected in the industry's plans.

The Study understands that, in order to meet its efficiency targets, NR expects to reduce staff numbers over Control Period 4 (CP4) by 6,300. Much of the reduction could come from the maintenance function, with further reductions from investment projects, and from operations staff (signallers and others). This equates to a 17% reduction in staff numbers and is predicted to deliver a corresponding 21% reduction in staff costs.

Two areas of further opportunity are in signalling, where a long-term capital expenditure programme is required to eliminate unproductive old technology, and in infrastructure expenditure.

Overheads

All parts of the railway have overheads. The rail industry, like any business or organisation, cannot operate without overhead functions, but excessive overheads reduce value for money. In looking at ways to reduce the industry's overhead burden, the Study has defined overheads as the cost of activities other than those relating to the immediate delivery of the railway product. The Study has distinguished between the overheads that exist within organisations directly involved in the operation of the railway, and industry administration, which relates to the functions, organisations and activities that oversee or provide support to the industry.

The industry needs to minimise its overheads and, where there are valid comparators, plan, as a first step, for overhead costs to be at industry average levels. Where comparators do not exist, the Study has focused on areas where overheads are increasing, or where changes in the industry structure would reduce or remove existing duplication of activities or "man-marking".

Administration

The number of administrative organisations for GB rail gives an indication of the extent of interfaces and intervention within the industry. By their nature, these organisations will generate interaction with TOCs, NR and the rest of the industry, resulting in a headcount multiplier effect. Although the administrative bodies represent a relatively small proportion of total industry costs, streamlining these functions would reduce overall industry costs.

The DfT has started its own staff and cost reduction exercise, but this cannot be completed until a determination is reached on the role of the DfT in the future industry structure. The same applies to the ORR, where the organisation needs to act as an example to the industry in pursuing efficiency improvements, but where its potential role as passenger champion and the need to regulate a route-based structure could put upward pressure on costs.

The Rail Accident Investigation Branch (RAIB), which is the industry's independent accident investigation body, undertakes investigations to which the industry and its Regulator are expected to respond. RAIB's investigations are part mandatory and part non-mandatory. RAIB is funded by the DfT, which determines the future scope and budget for the organisation.

Understanding how to reduce the administrative burden on the industry is important to obtaining value for money.

British Transport Police

The British Transport Police (BTP) costs approximately £250m a year, of which around £200m is spent on policing the main line national rail network. These costs are funded by NR, passenger and freight operators.

Since 2004, the British Transport Police Authority (BTPA) has been the independent body responsible for ensuring an efficient and effective BTP force for rail operators, their staff and passengers. It possesses the independence of a local police authority, but levies charges on a commercial basis from service users. It oversees a force that is responsible for a national transport network, rather than a geographic or territorial area.

BTP expenditure increased by 57% between 2004 and 2009 following critical reports by Her Majesty's Inspectorate of Constabulary and in response to external developments such as an increase in terrorist threats. Overall staffing has increased from a reported number of around 2,700 in 1998/99 to around 4,500 in 2009/10.

The Study commissioned AECOM to look at the strategic options for the BTP, reflecting the principle that there were no "no-go" areas for the Study. Some contributors to the research commented that, below some undefined level of activity, the BTP would lose critical mass and would not be an attractive option for career progression. They commented that effective railway policing reduced delays and disruption from incidents at stations, on trains and on the network. The Study found that the current level of policing is welcomed by the majority of TOCs, who believe there is a relationship between the level of policing and passenger usage. In contrast, FOCs have little need for the services of BTP, being located away from the concentrations of BTP activity. There was concern that if BTP's activities were reduced or transferred, other police forces may not regard policing of the railway as a priority.

Understanding how to match policing costs with the efficiencies that the rest of the industry will have to implement is an important part of the Study's work.

Pensions

Continuation of the Railway Pension Scheme (RPS) was enshrined in the 1993 Railways Act and secondary legislation, which provided protection to employees of the railway industry at privatisation regarding their right to belong to the RPS whichever employer they worked for in the industry. It also provided a right to participate in the RPS defined benefit pension scheme.

The RPS is divided into over 100 sections – one for each employer – which operate on a shared cost basis such that the employer will contribute 1.5 times the contribution of the employee.

The Study identified that there may be a medium-term risk to the cost of pensions. The combination of a long pension holiday during the 1980s and 1990s, subsequent poor investment returns, increases in pensionable pay and the increasing longevity of pensioners could put the overall funding of the scheme at risk, although recent pension funding developments may postpone this problem.

Human Resources management

Management of the industry's people has many facets and the Study has found virtual unanimity that it could and should be done very much better.

Training

Driver training in the GB industry can take between eight and twelve months, depending on the extent of the need for familiarisation with the characteristics of each route and the type of traction to be driven. Driver training time in other transport modes is significantly less than eight months (six weeks for HGV drivers and tram drivers has been cited). There is a requirement in nationally applicable Railway Group Standards to ensure drivers are competently trained and assessed on route and traction training knowledge. Precise details of training are determined by company standards, some of which are as a result of negotiation with the relevant recognised trade union.

A typical TOC would provide training for other staff:

- conductors – 35 days;
- retail – 12 days; and
- train dispatch/platforms – 7 days.

TOCs are estimated to spend £20m a year on operational training and have technological support equipment, primarily training simulators, with a capital value of £10m.

The Study is aware of training practices in other railways and other transport modes, including the development of self-funded training that is recognised by the award of a licence. While this is common in road and air, it is less common in rail, although there are instances of this approach in mainland Europe.

Development

The industry has moved to fill the gap in engineering training by the creation of NSARE (National Skills Academy for Railway Engineering). NSARE is recognised by over 60 companies, demonstrating the importance of attracting the right people into the industry and ensuring that the right people are being brought on to fill highly skilled technical roles in the future. The Academy approach has not been extended beyond engineering, although there are various railway institutions that encourage professional development.

The Study has not focused on the employment costs of people involved in the supply industry, but the Study is aware of concerns that the extensive use of contract and "zero-hours" labour, especially in renewals and enhancement work, can undermine attempts to create a skilled workforce.

Employee relations

Relationships with employees are handled by the individual companies within the industry. The employees are represented mainly by four trade unions:

- RMT (stations, signallers, maintenance workers, some drivers);
- ASLEF (most drivers);

- TSSA (clerical, administration and retail); and
- Unite (engineering).

The majority of employees in the industry belong to one of these trade unions.

The Study found a widely held view that the trade unions had adapted successfully to the post-privatisation industry structure and had secured significant improvements in salaries and terms of employment for their members. Given the cost pressures facing the industry, the Study believes that it is essential that meaningful dialogue between employers and employees is developed to focus on ways of achieving greater efficiency.

12.1.6 Recommendations for cost reduction

In making the recommendations set out below, the Study recognises fully that changes to terms of employment and pay are matters for negotiation and consultation between employers and employees and their representatives.

On-train staff

Driver Only Operation (DOO) is a safe method of operation and improves performance, with fewer human interactions involved in the door opening, door closing and dispatch procedure.

The financial imperatives facing the industry, the need to change radically the cost structure of the industry, and the availability of new communications technology has led the Study to recommend that the default position for all services on the GB rail network should be DOO with a second member of train crew only being provided where there is a commercial, technical or other imperative.

The Study recommends early implementation of DOO where practicable. Further implementation can take place when stations or rolling stock have been provided with the necessary equipment.

Retail

Determining the retail offer is a matter for individual franchises and franchise agreements, but the Study is of the view that TOCs and the DfT should take into account:

- the need for ticket office opening to better match trends in demand;
- the capability of modern retail technology, building on the growth in self-service and internet purchases;
- the societal trend for the automation of purchases, with human interfaces only being deployed for complex transactions;
- the growth in Smartcards, e-tickets, m-tickets and electronic purse that will cater for short- and long-distance journeys; and
- the fact that passenger security is not necessarily enhanced by the presence of a person in a ticket office.

Taking all these factors into account, the Study recommends that TOCs should consider:

- the closure of all Category E station ticket offices;
- reducing the opening hours at Category D station ticket offices;

- increasing the availability of TVMs at Category A to C stations, enabling a reduction in the number of ticket office windows;
- active encouragement of modern retail technology, and using price discounts to encourage greater use of that technology; and
- the setting of penalty fares at a level that deters fraudulent travel more effectively.

However, there are a number of important preconditions for such changes:

- the installation of sufficient modern and easy-to-use TVMs and provision of adequate information for passengers;
- the development of additional retail outlets, such as newsagents and convenience stores, to sell a limited range of tickets;
- the provision of simple internet portals for online purchases;
- the extension of print-at-home and mobile ticketing; and
- the amendment or removal by the DfT of the obligations in the TSA relating to ticket office opening hours, and the removal of the restrictions in the TSA on offering discounted fares to encourage use of particular retail channels.

In this, as in many other areas relating to people, the Government must signal its willingness to support and enable change.

Stations

The presence and number of dispatch staff could be affected by a range of future developments, such as:

- the replacement of the remaining "slam-door" rolling stock with carriages with power-operated doors;
- the redesign of some stations with resulting improvements in sight lines and crowd dispersal; and
- an increased use of remote monitoring from central control points.

It has not been possible to make any detailed assessment of the efficiency of station dispatch. This would require an examination of the relevant issues at each station, such as passenger volumes, platform geometry and lighting levels.

The Study recognises that TOCs are free to make commercial judgements on the need for dispatch staff within the bounds of their safety responsibilities and recommends that TOCs should review station staffing as a matter of priority.

Salaries and terms of employment

Employers and trade unions need to acknowledge the industry's financial position. Tackling fundamental employment issues requires a collective recognition of the need for change that is driven by effective industry leadership. Implementing change is the responsibility of individual employers. Making a difference in this area requires Government, employers, employees and employees' representatives to tackle the contractual, historical and societal barriers to change.

The Study believes that the expectation that salaries, at all levels of the railway industry, will increase ahead of inflation has to end. Indeed, with many passengers and taxpayers having their salaries frozen at present, even the granting of inflation-level increases must be questioned. This principle applies as much to the leaders of the industry as it does to the workforce.

It is not for the Study to provide a definitive plan for specific changes to terms of employment relating to individual job types or employers, but the Study believes that the overall trend to reduce continually the length of the working day and the working week is unsustainable.

The Study recommends that the industry needs to review:

- the limitations on work schedules that restrict the amount of work that can be undertaken during the working day;
- how to reduce the reliance on overtime;
- how to recognise that the railway is a seven-day operation;
- the timing, length and payment for meal and refreshment breaks;
- the amount of time required to prepare equipment for use;
- the maximum time that a person can work in a day, while recognising that there have to be objective tests as to whether fatigue will impact on effectiveness and safety;
- the time that staff require to rest between shifts; and
- the relationship of salaries to:
  - regional benchmarks; and
  - comparable jobs in other transport modes and other industries.

The Study does not underestimate the challenges that these issues represent and considers that one starting point would be to review the salaries and employment terms for new entrants to the industry.

Use of information technology in planning and allocating work

The Study commissioned work by Adventis to review the use of information technology in the planning and allocation of work for train crew. The work revealed a wide disparity in the deployment of technology, and that many operators were not optimising the planning and allocation of work.

The benefits of implementing information technology consistently across all TOCs has been evaluated, including improved reporting, optimisation of work schedules and allocations, and taking advantage of next generation technology. As a result, the Study recommends the implementation of this technology across the industry to enable more efficient deployment of people.

NR operations and maintenance

NR employed 8,600 signalling and operations staff at the beginning of CP4. This number should be able to be reduced to 7,600 by the beginning of CP5.

Signallers work with a wide range of technology from modern state-of-the-art signalling systems to mechanical signalling, which, while safe, is very labour intensive. NR is implementing a new

operating strategy that deploys modern signalling and control technology. The core elements are developing traffic management and operator roles, and migrating all elements of operational control to fewer centres.

The effect will be to reduce the number of signallers over CP4 and CP5. These reductions are part of NR's committed efficiency improvements for CP4 and are a key element of planned reductions in CP5. NR could accelerate investment and incorporate a greater part of the existing signalling into new operating centres than currently planned. In deciding its preferred option, NR will need to balance the availability of capital, cost savings and the risk of overheating the signalling supply industry. The Study is not making any additional recommendations and has not included any additional benefits from this area in its estimates.

NR employed 18,000 maintenance staff at the beginning of CP4, which could be reduced to 14,000 by the beginning of CP5. Many of these staff were previously employed in a number of maintenance companies. NR is undertaking a change programme involving the review of terms of employment.

NR intends to extend its programme of modernisation by deploying high-output machinery, automating track inspection and using components that require less maintenance. Each of these initiatives is fundamental to improved asset management.

Overheads

The Study recommends the implementation of several value for money initiatives that would reduce industry overhead costs. Plans for overhead cost reduction already exist, but the Study recommends that these should be implemented at greater speed than currently planned. In addition, the Study recommends further reductions. These include:

- reducing train operator overheads through all operators achieving existing average levels of indirect costs;
- reducing overheads in NR's project delivery function through aiming at a more demanding target than currently planned; and
- reducing NR's management, support and administration.

Compared with other longer-term savings that are recommended by the Study, many of the overhead efficiencies could be implemented relatively quickly. A new approach to franchising and devolution within NR should offer further opportunities for additional overhead efficiencies within CP4.

Administration

The ORR should lead by example by improving its efficiency to a level that reflects the expectations placed on the rest of the industry. The Study recommends that the ORR should be the single regulatory body for monitoring of whole-industry delivery of outputs, which will require the ORR to enhance its competence base by active recruitment from the rail industry.

The ORR could also take on the passenger ombudsman role, bringing Passenger Focus within the ORR; alternatively, Passenger Focus could be merged with a wider transport consumer group.

The Study has recommended the combining of technical research, approvals, engineering, standards and information systems leadership work, which will be drawn from RSSB, NR, the ORR and the DfT, into the Rail Systems Agency (RSA).

The Study recommends a number of changes in the role of the DfT, including taking a more high-level approach to project oversight and the degree of involvement with franchise management, which will reduce the interface costs incurred by the industry.

Parallel investigations into accidents and incidents involving the industry, the ORR, RAIB and the BTP may, at times, be necessary, but they do create cost. Each party, particularly RAIB, should consider whether the benefit of any investigations and recommendations beyond their statutory responsibility justifies the costs generated.

The Study has observed that ATOC carries out a wide range of activities, including those of a traditional trade association through to hosting cross-industry information systems. The Study recommends that, as part of wider industry restructuring, the industry should review whether the continuation of the entire suite of ATOC's existing responsibilities represents value for money.

British Transport Police

The Study recommends that the DfT and the British Transport Police Authority (BTPA) should review the strategic options identified by the Study's research as potentially providing opportunities for further cost reductions beyond planned efficiency savings. The options included:

- the transfer of some of BTP's activities to other forces and the sharing of specialist functions and support activities;
- extending efficiency opportunities, including a review of the staffing mix, merging HQ functions and revisions to rostering;
- local alignment with train operators and infrastructure managers, and a revised service specification procedure; and
- major structural change, such as merging BTP with other forces in Great Britain in order to remove overhead costs.

The Study recognises the aspiration of the BTPA to reduce the police budget by 15% through incremental efficiency measures during CP4 and CP5, as well as taking into account the Winsor Review.[74] The Study has included the incremental efficiency plans in its forecasts. The implementation of additional strategic options could potentially create further savings, in line with those likely to be required from the rest of the industry, and would create the opportunity to align policing with the future structure of the railway.

Pensions

An independent report by Peter Thompson FIA, one of the authors of the Railway Pension Commission report published in 2007, was commissioned to examine the costs of pension provision in the rail industry. The report found that the total contribution to the Railway Pension Scheme (RPS) in 2009 was £637m, of which employers paid £389m and members of the RPS paid £248m.

The interim RPS valuations on 31 December 2008 and 2009 created expectations of a significant funding shortfall in the RPS. It is now expected that, while the December 2010 valuation will still show a significant deficit, it is unlikely to give rise to a serious short-term funding problem. The

74 Winsor, T. P. (2011) *Independent Review of Police Officer and Staff Remuneration and Conditions: Part 1 Report*. London: TSO.

performance of the markets and the change from Retail Prices Index (RPI) to Consumer Prices Index (CPI) as the determinant of inflation increases are the major contributors to this position.

The Study notes that, in recent years, other industries have sought to contain pension costs and have made significant changes to pension schemes. It will be necessary to reduce the cost of rail industry pension contributions by employers and employees over the longer term. The pension report identifies a range of options, including changes to the retirement age, reducing pension accrual rates, extending new pension schemes and adjusting retirement benefits.

The Study recognises that changes to the RPS will be a matter of discussion between employers and members' representatives, and will be subject to the agreement of the trustees of the RPS and therefore does not make a specific recommendation as to which options should be selected. The Study has not included savings from pensions in its forecasts. Nonetheless, it seems clear that the structure of the RPS needs to be discussed sooner rather than later so that the financial exposure of employers and employees can be mitigated to a greater extent.

Human Resources management

Training and people development

The Study recommends a greater use of technology to deliver training, reduce training time, minimise the need for in-situ learning and improve efficiency. Experience of the introduction of signalling simulators in 2005 showed a reduction in total training time by 10%.

There is an opportunity for a fundamental review of training techniques and the time needed to train specific work groups. The reduction in training time will have some financial benefit, but the true benefit of effective training is a better equipped, more flexible and productive workforce.

A "new approach to the rule book" is being developed by the industry, and the benefits from a competence-based approach will simplify rules learning and reduce training time.

The Study considers that current trends in training point in the direction of a move to college-based training of key industry skills, resulting in the award of a competence licence. This would increase the mobility of staff and encourage competition in training provision.

People development

The industry should leverage the use of its training facilities, such as NR's Westwood Centre. Graduate development should be co-ordinated across the industry and a core introduction course should be developed to provide a wider overview of the business requirements of the industry's various sectors and to establish the desired industry cultures and networks from the beginning of future managers' rail careers. The successful apprenticeship programme introduced by NR should be extended across the industry.

Flexible employment and equal opportunities

The industry employs a workforce that is predominantly full-time, even though the peaks and troughs of much railway activity would be attractive to part-time employees. The Study recommends that the industry's employers should continue to encourage a more flexible and diverse workforce and, in particular, provide opportunities for more women to be part of the industry.

The Study does not, however, support the widespread employment of unskilled casual labour. The Study believes that this undermines the need to increase the competence of the industry's workforce.

Employee relations

Improving employee relations is the responsibility of everybody in the industry, but the development and attraction of highly experienced and successful Human Resources people in the rail industry is particularly important. The Study has identified the need for improved relationships and partnering across all the industry's activities and the relationship between employers, employees and their representatives is no exception. Faced with an extremely difficult financial position, the industry must work with its people to bring about change while keeping everybody in the industry informed. One key element of reducing the cost of the railway is reducing the industry's employment costs. Achieving this, while ensuring that the staff remaining in the industry have more satisfying and rewarding employment, is a critical factor in delivering value for money.

It is essential that employee representatives at national and local level are fully involved with the implementation of change. This is not a time-limited obligation; it must be undertaken from the beginning of the change process right through to the end. Improved employee relations will make the industry better able to handle the significant changes that the Study envisages. This is a key enabler to the changes identified in this report.

12.1.7 Potential for, and timings of, cost savings

The Study has forecast net expenditure savings of £256m in 2018/19. Capital expenditure and redundancy payments will be needed to achieve these savings.

The Study believes that some early savings could be achieved, although these would be partially offset by the need for redundancy payments for savings to be achieved in CP5.

12.1.8 Implementation plan

The Study has identified a range of significant opportunities to achieve improved value for money in the people area. The delivery of those opportunities rests primarily with companies and employers, who should develop their priorities and plans and take forward the processes of consultation and negotiation with employees and their representatives. Whether it is the introduction of new technology or the implementation of a training and development programme, the responsibility for planning and delivery has to be with individual TOCs, infrastructure managers or administrative bodies.

The Government and the ORR will need to set overall policy, offer guidance, and put in place incentives and contractual mechanisms that encourage change. Management of that change must lie with the leaders of each organisation involved in the industry.

The Study recognises that, in some cases, changes will be subject to a risk assessment and will have to be compliant with the safety obligations of individual duty holders. The ORR, as safety regulator, will maintain an overview of change in this, and all other, areas of the Study.

As a result, any overall implementation plan has to be at a high level and would have to be adapted to reflect the specific circumstances of employing bodies. The Study suggests the following illustrative schedule for activities that need to be undertaken.

Quarter 3, 2011

Determine the priorities in each area of change, including:

- the routes on which DOO could be introduced;
- the ticket offices that could be closed or where opening times could be reduced;
- the terms of employment that ought to be amended;
- the salaries and terms of employment for new starters; and
- the organisation changes needed to reduce overheads and administrative costs.

Quarter 4, 2011, to Quarter 1, 2012

Commence the consultation and negotiation process:

- with the trade unions on a company by company basis;
- with statutory consultees to advise of changes; and
- with contracting parties to change contractual terms and create more freedom for action.

Quarter 4, 2011, to Quarter 4, 2012

Undertake enabling work to permit changes to be made, including:

- equipping stations with cameras, mirrors and lighting to accept DOO services;
- modifying rolling stock to enable DOO;
- installing additional TVMs;
- training staff in DOO and other new methods of operation; and
- obtaining the relevant approvals to commence new methods of operation.

Quarter 1, 2013, to Quarter 4, 2013

Start to implement change:

- new DOO services introduced;
- ticket office closures and reduced opening hours;
- new terms of employment introduced; and
- new organisational structures or organisation mergers put in place.

In parallel to these initiatives, the changes proposed in the planning and allocation of work, implementing efficiencies in the BTP, and the introduction of new approaches to training and development should be implemented.

13. Freight

13.1 Introduction

The Study recognises the importance of rail freight to the economy and the environment, and wishes to ensure that the various changes recommended by the Study further the growth of rail freight while ensuring that this sector of the GB rail industry makes a contribution to the achievement of value for money.

13.2 Executive summary

The rail freight industry delivers economic and environmental benefits to the UK economy. The industry has invested heavily and achieved significant cost reductions in a competitive market. The industry operates across the entirety of the GB rail network and will require the retention of a national and system-wide approach to activities such as capacity planning, network capability and timetabling if it is to capture further traffic from road.

The Study is conscious of the Secretary of State's commitment in his written statement that accompanied the publication of the Study's Interim Submission on 7 December 2010, in which he said:

> *"I am also clear that the changes the Study is proposing must protect the interests of freight operators on the network."*[75]

The rail freight industry can contribute to rail value for money by maintaining its flexibility of operation, using network capacity more effectively, identifying routes that do not require to be maintained for freight services and demonstrating to the rest of the industry the techniques it has employed to improve productivity.

13.3 The GB rail freight industry

At privatisation rail freight operations were sold outright to two companies. Over the last 15 years these companies and new entrants into the market have attracted private-sector investment in rail freight equipment – £1.5bn is quoted by the Rail Freight Group[76] – such as locomotives, wagons, yards, terminals and information systems. This investment has contributed to rail freight operators becoming increasingly competitive with each other and with other modes. One result of competition has been a reduction in prices, where the beneficiaries have been rail freight shippers and their customers.

The Study notes that the low point of rail freight traffic was in 1994/95 when 13bn net tonne kilometres were moved. From then, until just before the recession, **rail freight activity increased by 68%** to 21.9bn net tonne km. In the last four years activity has fallen as demand for bulk, manufactured and consumer goods reduced, but the 2009/10 figure of 19.06bn net tonne km is still 47% higher than the low point in 1994/95.

75 www.dft.gov.uk/press/speechesstatements/statements/hammond20101207.
76 Rail Freight Group website: www.rfg.org.uk/about-rfg.

13.4 The economic benefits of rail freight

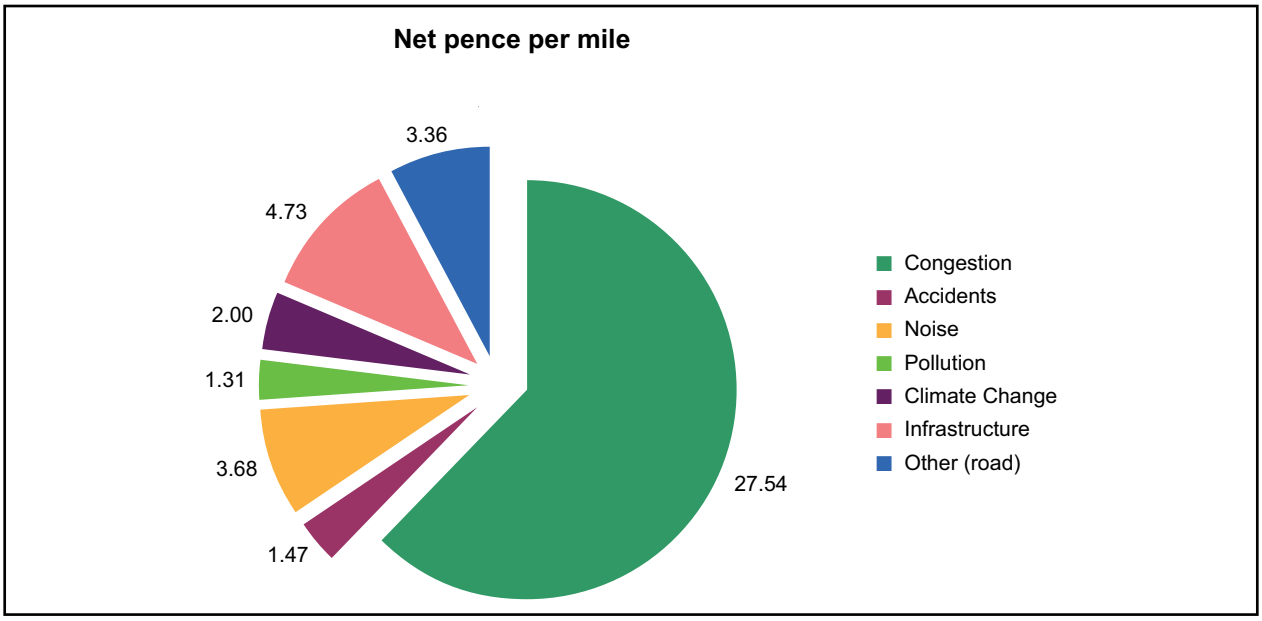
The Study's research has identified that the rail freight industry directly contributes about £870 million to the nation's economy, including £299m in profit and wages,[77] but that the real economic impact is far greater. The total contribution to the economy, including both the indirect effect[78] and the induced effect,[79] is calculated to be £5.9bn per annum.[80] The Eddington Report (2006) estimated that road congestion reduces GDP by between £7bn and £8bn per annum.[81]

Without rail freight there would have been an additional 6.7m road journeys in 2007/08.

Network Rail (NR) estimated that the value of the freight carried by rail per annum was £31bn, including £19.9bn of consumer products.[82] The efficient and timely delivery of such goods holds a high value to the end user, although in many instances the transport cost is a small proportion of the overall value of the goods. The Office of Rail Regulation (ORR) has estimated the value to the end user of a deep-sea intermodal train to be £1,069 per hour.[83] Using this estimate, the value of one hour extra journey time for all deep-sea intermodal trains is approximately £38.5m per annum (based on 36,000 trains per annum), emphasising that journey time is as important for some freight services as it is for passenger services.

Rail freight benefits are currently almost exclusively calculated on the externalities saved at the margin versus road. For instance, the Department for Transport (DfT) uses Mode Shift Benefits (MSBs) to value the benefit of rail freight. Figure 13.1 illustrates the average values per lorry mile removed from the road network, net of taxation and rail/water externalities, and reinforces the importance that is attached to reducing congestion.

Figure 13.1: Average values per lorry mile removed from the road network



Source: RFOA, RFG, Campaign for Better Transport, Freight Transport Association.

77 Network Rail (2010) *Value and Importance of Rail Freight*. London: Network Rail.
78 The sum of inter-trading between business added to the direct turnover.
79 Adding the expenditure driven by the household income derived from the rail freight sector.
80 Network Rail (2010) *Value and Importance of Rail Freight*. London: Network Rail.
81 Sir Rod Eddington (2006) *The Eddington Transport Study*. London: TSO.
82 Network Rail (2010) *Value and Importance of Rail Freight*. London: Network Rail.
83 AECOM/ITPS (2010) *Rail Freight User Values of Time & Reliability: Final Report*. London: ORR.

13.5 The environmental benefits of rail freight

The DfT estimates that rail freight uses 70% less carbon on average per tonne mile than road freight.[84] Analysis of carbon savings made by rail in the deep-sea container market[85] found that road transport emitted 2.84 times more CO_2 per container mile. Assuming an oil price of $80 a barrel, which equates to £56 per tonne of CO_2 emitted (Stern Review (2006)[86]), the carbon saved in 2007 by the deep-sea rail sector was £18.5m[87] over the road alternative. It is estimated that, by 2019, against a backdrop of an increasing cost of carbon, growth in the deep-sea market and sustained modal split, that the savings could reach £42m.

In their responses to the Scoping Study, stakeholders focused on rail freight's environmental credentials. They commented that rail freight's CO_2 emissions are up to five times lower than road and, therefore, present greater decarbonising potential than any other traffic using the rail network. When added to rail's modally advantageous performance in noxious emissions, such as Nitrous Oxide and PM10s, the increased use of rail to meet sustainability objectives is now seen as a critical part of rail freight customers' corporate and social responsibilities.

The Study understands that rail freight is improving its own environmental performance through the use of lower emission engines, improved fuel utilisation and policies to reduce idling engines and excessive power applications. Rail freight's advantages in this area are reinforced by Government's willingness to buy the non-user benefits created by rail when it enables sensitive lorry miles to be avoided. Benefits such as reduced congestion, fewer road accidents, less polluting emissions and less CO_2 are all seen as having fiscal advantages for the nation.

The economic and environmental benefits of rail freight reinforce the importance of looking at freight on a multimodal basis and recognising the positive effect on congestion and other areas of UK competitiveness that rail freight can generate.

13.6 Rail freight and the Rail Value for Money Study

The Study received information from the representative bodies of the rail freight and individual companies engaged in rail freight transportation.

The representations by the rail freight industry have emphasised the following points:

- GB rail freight operators move 100 million tonnes a year and have a market share of surface freight transport approaching 12% compared with 8% at the time of the privatisation of Britain's rail freight industry. Enabling rail freight to expand and thrive is a responsibility of the whole rail industry.

84 Rail Freight Operators' Association/Rail Freight Group (2009) *Manifesto for Rail Freight Growth, Paper 8, Environmental benefits*. London: RFOA/RFG, quoting Department for Transport (2007) *Towards a Sustainable Transport System: Supporting Economic Growth in a Low Carbon world*. London: DfT.
85 Freightliner Group Limited (2007) *The Value of Carbon Saved by the Deep-sea Rail Sector*. Freightliner.
86 Stern Review (2006) http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/sternreview_index.htm
87 Based on 824,322 containers.

- Rail is becoming a key part of the logistics chain, with supermarkets and third-party logistics providers looking for alternatives to road transport. Rail volumes are increasing between UK distribution centres, adding to intermodal activity through the Channel Tunnel and the deep-sea ports. The advent of temperature-controlled services from mainland Europe, which are achieving up to a day's quicker journey time than road haulage, is a demonstration of rail's strength.
- One in every four deep-sea containers that arrive or depart from the major deep-sea ports is carried by rail. Rail now has a 30% market share in container traffic to the West Midlands and the North West – a figure that will rise further as the network is enhanced to accommodate the increasingly popular 9'6" high container. Deep-sea containers moved by rail have increased from 450,000 to 850,000 per year (78%) since privatisation, with a right time delivery of 98%.
- Over 25% of the electricity consumed in the UK is generated by coal that has been moved by rail.
- Rail moves aggregates and cement into major conurbations to enable building developments. For instance, in London over 40% of raw materials are delivered by rail[88] and rail played a major part in the delivery of construction materials to Heathrow Terminal 5 and the Olympics.
- Steel making and car manufacturing make use of rail in their supply chains delivering raw materials, parts and finished goods around their centres of production or distribution.
- The equivalent of 55,000 lorry movements of domestic rubbish is removed from the major cities by train every year.[89]

13.7 Financial performance of the rail freight sector

In reviewing the position of rail freight, the Study has had regard for the financial sustainability of the industry and its ability to bear additional costs or to make further contributions to the overall economics of the GB rail industry. The Study is aware that rail freight operators generate low margins. Table 13.1 shows the published data for the largest freight operators. Two operators have ceased trading in the past two years.

88 Transport for London (2007) *Rail Freight Strategy*. London: TfL.
89 Network Rail (2010) *Value and Importance of Rail Freight*. London: Network Rail.

Table 13.1: Financial performance of largest GB rail freight operators

	Freightliner	DB Schenker	GBRf	DRS	Industry total	% of turnover
Year ending	28/3/09	31/12/08	31/3/09	31/3/09		
Turnover	299.0	464.0	55.7	47.0	865.7	
Profit after tax	(6.5)	19.0	2.0	0.2	14.7	1.7%
Profit after tax*	(6.5)	(20.0)	2.0	0.2	(24.3)	(2.8)%

* Excluding sale of fixed assets.

The Study has been advised that, although rail has achieved an increase in modal share from road in containerised freight, the recession has had a significant impact across all sectors of rail freight, with reduced volumes in many commodities, most notably coal and aggregates. As a result there is now some over-supply in the market, and with long leases on equipment and a high proportion of fixed costs, rail freight operators are finding it difficult to further reduce costs.

13.7.1 Rail freight's financial contribution to the GB rail industry

The principal mechanism by which rail freight operators contribute income to the GB rail industry is through the payment of track access charges. Access charges for freight include:

- a variable charge that reflects the wear and tear that freight trains impose on the network;
- the fixed cost of freight only lines (for commodities that can afford to contribute to these costs);
- a capacity charge;
- a coal spillage charge;
- an electrification asset usage charge;
- electricity for traction charges; and
- access charge supplements to cap the exposure caused by the performance regime.

Road freight contributes towards the infrastructure it uses through Vehicle Excise Duty and tax on fuel consumed. Rail freight also has to pay tax on the fuel it consumes, albeit at a lower level than road, but unlike road it has to pay directly for the wear and tear that it causes to the rail network.

Rail freight has to compete for space on the rail network with other users and follow industry processes to ensure that trains are able to run. In contrast, road hauliers enjoy access to the network, which is free at the point of consumption, without any restrictions imposed as a result of competing demands for the use of the network.

These are not issues confined to Britain. Rail freight operations throughout Europe find themselves in the same competitive position with other modes. The European Commission has issued Directives relating to rail freight access charges whereby freight, while obliged to pay the wear and tear it causes to the rail network, must not be excluded from the network by the levying of charges not related to wear and tear. These principles have been adopted by the ORR in its freight charging policy.

The rail freight industry states that certainty in the regulatory and contractual framework is vital in enabling continued private-sector investment. This is particularly important in relation to the charges for access to the rail network and access to suitable capacity. Certainty in these areas allows effective business planning through investment and cost control.

Access charges cannot be reviewed until Control Period 5 (CP5) (2014), unless a pre-determined set of circumstances arises. The Study recognises that the current five-year settlements are very short compared with the typical 30-year life of assets in which the sector invests to meet demand and achieve efficiencies.

The Study recommends that **freight access charges** should continue to be:

- administered centrally and levied on a national and homogenous basis; and
- compliant with European Directives.

13.8 Specific issues affecting the rail freight industry

The recommendations being made by the Study will affect all users of the rail network. Rail freight is no exception. Conscious of the importance of rail freight and the need to encourage its growth, the Study has identified a number of areas where the needs of freight will need to be taken into account in any industry restructuring. These areas are:

- national operations and timetabling;
- national capacity allocation and capacity planning;
- national approach to network capability;
- national approach to infrastructure maintenance and renewals planning; and
- the impact of devolution on rail freight.

The importance of protecting rail freight was recognised by the Secretary of State in his written statement that accompanied the publication of the Study's Interim Submission on 7 December 2010, in which he said:

> *"I am also clear that the changes the Study is proposing must protect the interests of freight operators on the network."*[90]

90 www.dft.gov.uk/press/speechesstatements/statements/hammond20101207.

13.8.1 National operations and timetabling

The rail freight sector moves freight over long distances between the regions of the UK. The routes used by freight do not fit easily into the traditional railway regions, or current NR routes; typically each train movement traverses up to three or four of these.

Freight trains operate within the timetabling rules of the railway. During the creation of a timetable most freight services can be moved by up to an hour to accommodate the more rigid timetables of passenger operators. The Study believes that, in a growing railway, maintaining this flexibility is essential.

Local operational management is a fundamental part of the Study's support for decentralisation. The Study appreciates, however, concerns from national operators that they do not want a replication of the problems caused, for example, by international boundaries in Europe, where different technical and operational rules hinder cross-border services. The operation and timetabling of trains that cross local boundaries will require the oversight of a national operations and timetabling function that will also need to manage performance of these services on a national basis. The Study sees that this is not just a freight issue, as long-distance passenger services that cross multiple operational areas will also benefit from this national approach.

The Study recognises the importance to freight of **maintaining a national operations and timetabling body.**

13.8.2 National capacity allocation and capacity planning

The rail freight industry has also pointed to the **continuing requirement to allocate capacity at a national leve**l to ensure that there is long-term certainty that growth in freight, which will cross local operational boundaries, can be assured. The industry has pointed out that projects of political importance, such as West Coast Route modernisation, Crossrail and Thameslink, have seen attempts to override the agreed principles of capacity allocation to ensure that capacity is available for the projects at the expense of the existing users of the railway. In each of these cases, Regulatory intervention has secured adherence to existing capacity allocation principles.

The rail freight industry has also pressed for **strategic reservation of capacity** to enable rail freight growth, pointing out that, without such reservation on key routes for freight, it is possible that local pressure will take capacity for services that meet local needs at the expense of capacity of national importance.

The Study recognises the importance of **retaining a national capacity allocation function**.

13.8.3 National approach to network capability

For services that traverse a number of operational boundaries, the continuation of a **national approach to issues such as the capability of the network** is essential. This would include a national approach to specific freight train requirements, such as axle weight and loading gauge.

A national approach to capability issues has started to bear fruit through the implementation of the Government's policy for a Strategic Freight Network (SFN), which states:

"We need to make the fullest use of the UK's predominantly mixed-traffic rail network. Conflicts occur between passenger and freight requirements (and between different types of passenger services) at numerous points on the railway, eroding network capacity and reliability. At present the network is almost nowhere optimised for freight, which reduces the efficiency of the UK's rail distribution logistics.

The SFN is intended to provide the framework for targeting investment and network management better to meet freight requirements and to resolve such conflicts. This should both improve the logistical efficiency of the railway and secure network capacity and reliability gains to the benefit of all users. The SFN is therefore a key element in making the best use of existing and future rail resources."[91]

The Study has reviewed the principles that support the SFN and agrees that they represent a useful summary of the pre-requisites to achieve further growth in rail freight:

- ensure that the network can accommodate longer and heavier freight trains that will use network capacity effectively;
- operate the network so that freight trains, like heavy goods vehicles (HGVs) on the roads, can be moving 24 hours a day, seven days a week;
- accommodate deep-sea and European containers on key routes through targeted gauge enhancement, and look at the options for improving connectivity to mainland Europe by upgrading a south–north route to accept continental gauge wagons;
- encourage the development of additional rail freight interchanges and terminals through a supportive planning process; and
- identify optimal freight routes connecting the major centres of production and consumption in Britain, including the major ports and the Channel Tunnel. Ensure that capacity for freight is provided on those routes or on parallel routes that bypass major conurbations, and protect freight capacity for the future on these and other key routes.

The Study notes that the **development of a SFN remains Government policy** and believes that this is aligned to the Study's recommendations on freight.

13.8.4 National approach to infrastructure maintenance and renewals planning

An industry structure or mechanism that enables the co-ordination of engineering work and possession planning over core and diversionary routes will be needed by all national operators. While decentralisation of NR's activities to the local level will place much of the responsibility for maintenance and renewal where local requirements can best be assessed, the Study acknowledges that there is a national angle to this activity.

For example, at present an engineering renewal and possession plan that blocks the South West Main Line to containers from Southampton would ensure that an alternative route via the Great Western Main Line was available. In future there would need to be a national co-ordination activity policed by the ORR that ensured that a fit-for-purpose diversionary route was available.

91 Department for Transport (2009) *Britain's Transport Infrastructure Strategic Rail Freight Network: The Longer-term Vision*. London: Department for Transport. This document can be accessed at www.dft.gov.uk/pgr/rail/strategyfinance/strategy/freightnetwork/.

The Study recommends that the **needs of freight are recognised in the future mechanisms introduced for planning the maintenance and renewal of the network.**

13.8.5 The impact of devolution on freight

The rail freight industry has acknowledged the benefits of being able to compare the performance of one local operational unit with another in identifying best-practice in infrastructure and operational management. However, the industry points out that the local or regional focus may cause national interests to be marginalised or even ignored.

To overcome these concerns the rail freight industry has pressed for freight representation on the Boards of regional or vertically-integrated companies. This, they feel, will ensure that infrastructure asset condition is at least retained, and ideally improved, to meet the needs of national operators so that, for example, the same train does not operate at different speeds in adjoining local areas because companies have taken diverging approaches to asset management.

Further protections for freight could be established by placing on local companies specific requirements to promote freight, reflecting those already placed on the ORR.

The Study recommends that the **existing regulatory protections for freight and other users of the network are retained and, where necessary, strengthened to reflect the new interfaces emerging as a result of industry restructuring.**

13.9 Rail freight's contribution to value for money

The rail freight industry has much to contribute to achieving value for money in the GB rail industry.

Rail freight operators can create value for money by **making effective use of the network.** This involves:

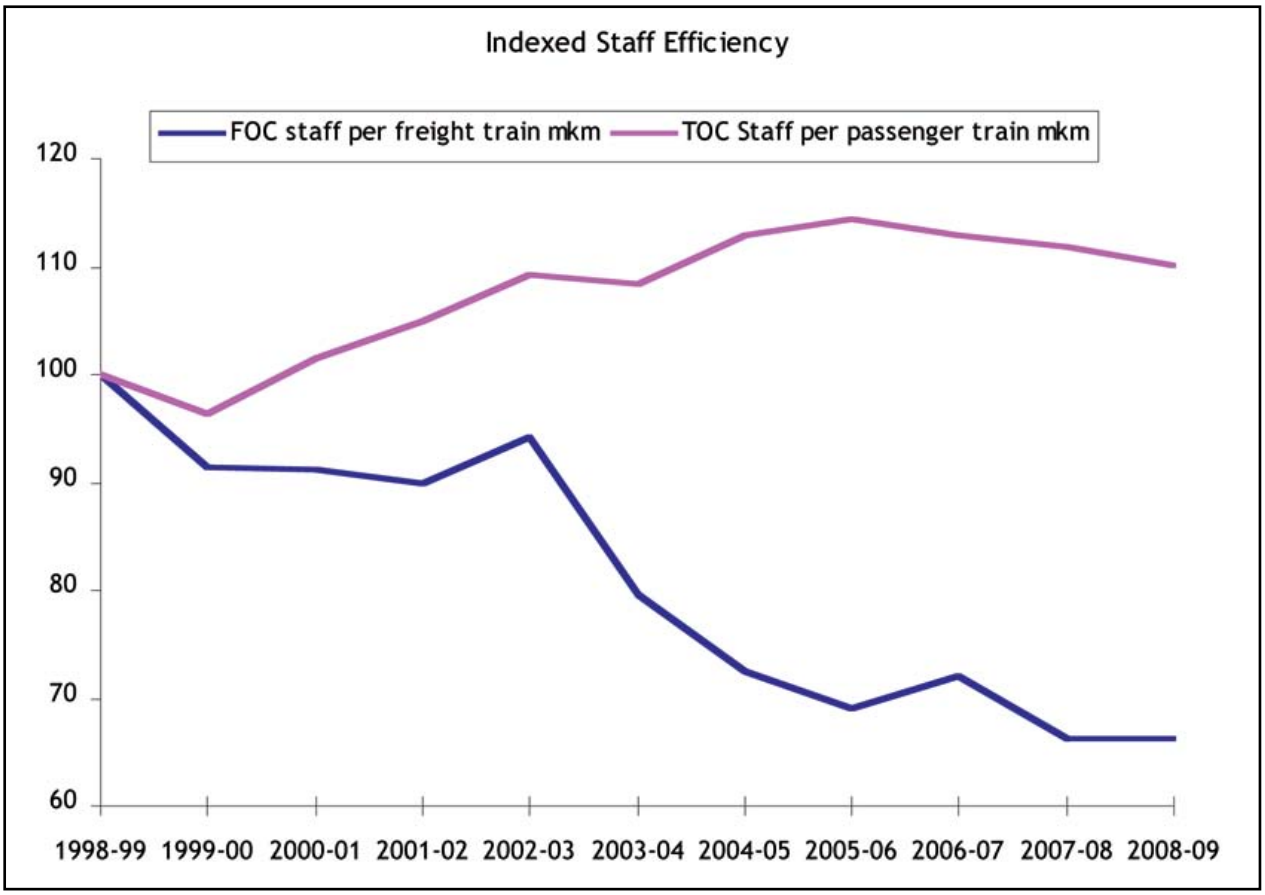
- maintaining operating flexibility to accommodate rigid passenger timetables;
- continuing the existing practice of minimising operations during the periods of peak passenger operation around London;
- maximising the length of each train so as to move a given volume of freight in the least number of network paths;
- relinquishing unused paths, although the Study acknowledges the need for strategic freight capacity and flexibility in freight path provision to accommodate the diversions required by engineering work and the volatile nature of the freight market;
- supporting reform of industry processes to accelerate changes to capacity allocation and network capability;
- amending operating practices to minimise the impact of freight trains on low volume/low maintenance branch lines; and
- agreeing to the removal of freight capability on some routes where there is no prospect of freight activity and which can be downgraded to accommodate light weight passenger trains with commensurate savings in track maintenance and renewal costs.

The rail freight industry should also **share with the rest of the industry techniques and methods to improve efficiency**. Faced by a competitive environment with other transport modes and with each other, the freight operators have focused on reducing costs and improving service. In their Manifesto for Rail Freight Growth, the Rail Freight Operators' Association and the Rail Freight Group (RFG) stated that:

> "*Over the last 14 years rail freight operators have invested heavily in new equipment with low maintenance costs, reducing the assets they employ. Rail freight growth of 60% has been achieved using only half the locomotives and two-thirds of the wagons employed in the mid-nineties.*"[92]

Figure 13.2 shows the relative efficiency performance of Freight Operating Companies (FOCs) and Train Operating Companies (TOCs) since 1998/99 as measured by the number of staff per unit of output.

Figure 13.2: Comparison of freight and passenger staff productivity (train-km)



Source: Study.

92 Rail Freight Operators' Association/Rail Freight Group (2009) *Manifesto for Rail Freight Growth, Paper 6, Efficiency Delivers Growth*. London: RFOA/RFG.

13.10 Conclusion

Rail freight exists in both a rail and modally competitive market, but with no commitment from Governments to perpetuate its existence. By paying its wear and tear costs, rail freight ensures that the network provider is no worse off from the existence of freight than from its absence.

The increasing recognition of the role that rail freight is expected to play in the economic and environmental well-being of society means that the whole rail industry should work together to ensure rail freight's growth and sustainability. The Study recognises that the needs of the rail freight industry must be taken into account in any changes made to the industry as a result of this report.

14. Rolling stock

14.1 Description of studies and analysis

This section considers how to improve value for money by better whole-life management of GB rolling stock, and what steps are necessary to deliver this.

Whole-life management of rolling stock encompasses:

- the planning, specification, development, manufacture, operation, maintenance and disposal of rolling stock;
- the leasing of rolling stock from rolling stock owners to train operators, including the effectiveness of the relevant markets; and
- programme management, asset management and supply chain management of rolling stock.

The principal work initiated by the Study involved:

- a study by Arup to look at rolling stock provision in GB rail which included supply chain management issues of this specific market; and
- a series of follow-up workshops and discussions with the Department for Transport (DfT), Rolling Stock Companies (ROSCOs), Train Operating Companies (TOCs), rolling stock manufacturers and rolling stock maintainers.

14.2 Evidence base

The Study's assessment is based principally on:

- the Arup report on whole-life cost of rolling stock;
- the wider Atkins assessment of rail asset and supply chain management; and
- an internal high-level supply chain segmentation assessment of the rolling stock new equipment, re-leasing and franchising markets.

To supplement the findings, the Study has also drawn on other recent reviews and studies and the Study's own analysis. Principally these include:

- Civity (2010) *International Benchmarking*;
- *High Speed 2: Command Paper* (2010);
- the Competition Commission's review of rolling stock markets in GB reports between 2007 and 2009; and
- Sir Andrew Foster (2010) *Review on the InterCity Express Programme* (DfT).

The Study has reviewed over 20 industry submissions to the Study and held meetings and workshops with the Railway Industry Association (RIA) involving a cross-section of its members, in addition to focused workshops with the Association of Train Operating Companies (ATOC)

Engineering Council, and one-to-one meetings with key suppliers in both the rolling stock and infrastructure supply chain. The Study has also held several meetings with the DfT and the ROSCOs on rolling stock leasing.

Over the course of the study, the Study held nine stakeholder meetings which focused on supply chain and asset management issues in general. These were attended by clients and suppliers, and provided constructive challenge to the Study's work and emerging findings.

Finally, the Study held a series of workshops and meetings with ROSCOs, the DfT and TOCs to discuss the implications of the initial rolling stock findings.

14.3 Key data

14.3.1 Background information on GB passenger rolling stock

GB passenger rolling stock fulfils a range of different requirements, from high-speed InterCity through to local commuter services. The UK operates six basic types of rolling stock, as shown in Table 14.1.

Table 14.1: Rolling stock types and numbers

Basic type	Number of classes	Number of vehicles
High-speed trains	1	174
InterCity	8	2,156
Inner-suburban	16	2,690
Outer–suburban	21	4,172
Rural/branch line trains	16	1,204
Inter-regional	8	1,223
Total	**70**	**11,619**

Source: DfT, April 2011.

As well as having different requirements for speed, stopping patterns and levels of comfort, the detailed engineering specifications can be quite different.

Rolling stock is typically designed for a 30-year life; however, this is normally extendable to 40 years. Economic life extension requires integrating the necessary changes to major systems with the rolling stock's scheduled deep maintenance overhaul.

On average, new rolling stock vehicles cost between £1m and £1.4m to procure. Electric Multiple Units (EMUs) are normally cheaper than Diesel Multiple Units (DMUs). The trend in vehicle costs is slightly rising over the last 20 years due to increased complexity, for example the fitting of systems such as air conditioning, automatic doors and passenger information systems.

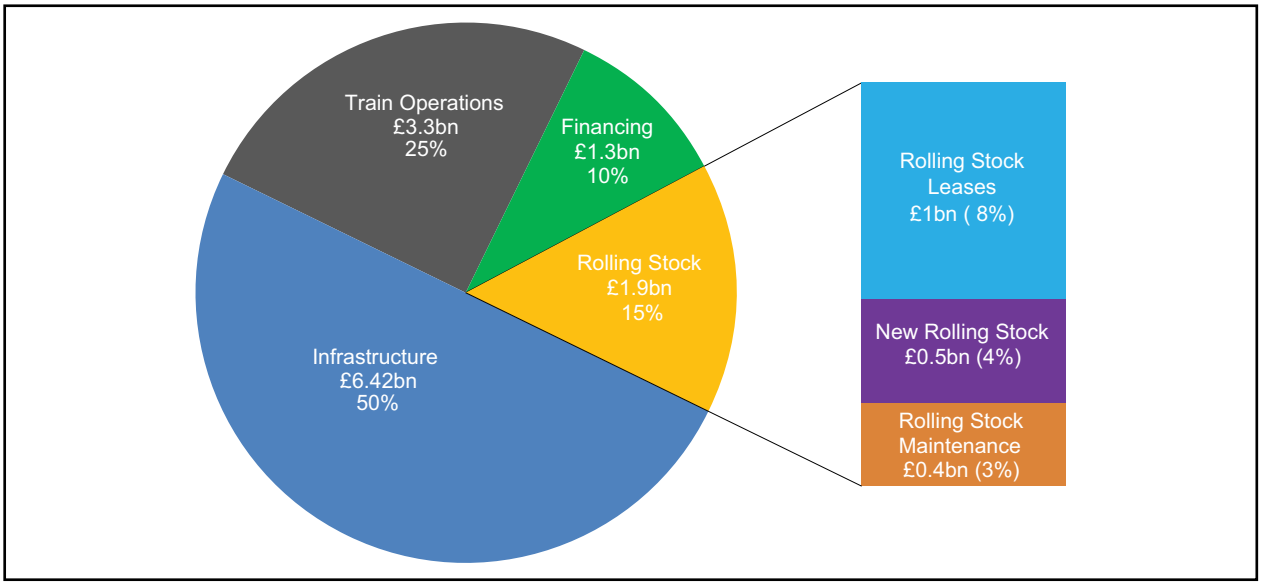
The current industry roles with respect to rolling stock are:

- TOCs operate the rolling stock and some undertake light maintenance;
- ROSCOs own and lease the rolling stock and undertake some maintenance;
- rolling stock manufacturers build and sometimes maintain trains;
- specialist equipment suppliers provide sub-systems such as bogies, brakes and wheelsets; and
- specialist maintenance suppliers provide maintenance services.

14.3.2 Rolling stock whole-life costs as a proportion of industry costs

Atkins' analysis of GB rail showed that rolling stock costs were about 15% of total industry costs (Figure 14.1). Around half of this was lease costs, with the remainder maintenance and procurement of new stock.

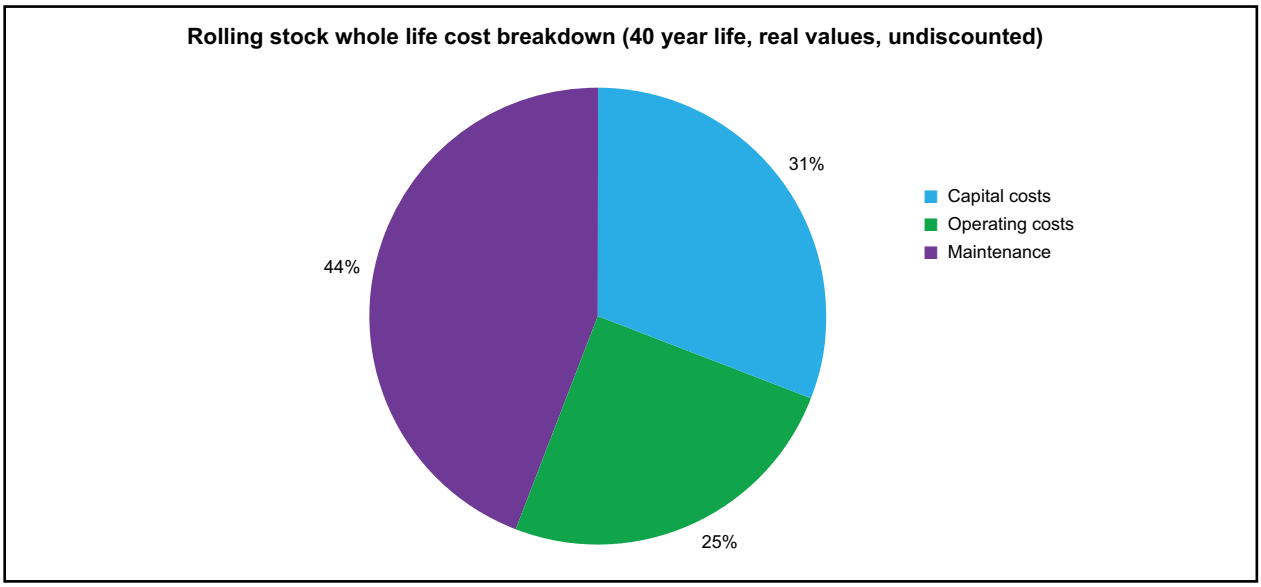
Figure 14.1: Rolling stock costs against wider industry costs



Source: Atkins.

Arup's more detailed analysis of a specific, representative rolling stock life-cycle showed the split between capital, maintenance and operating costs (Figure 14.2). When the financing costs and discounting are included, the capital cost of rolling stock is about 60% of whole-life costs.

Figure 14.2: Rolling stock whole-life costs

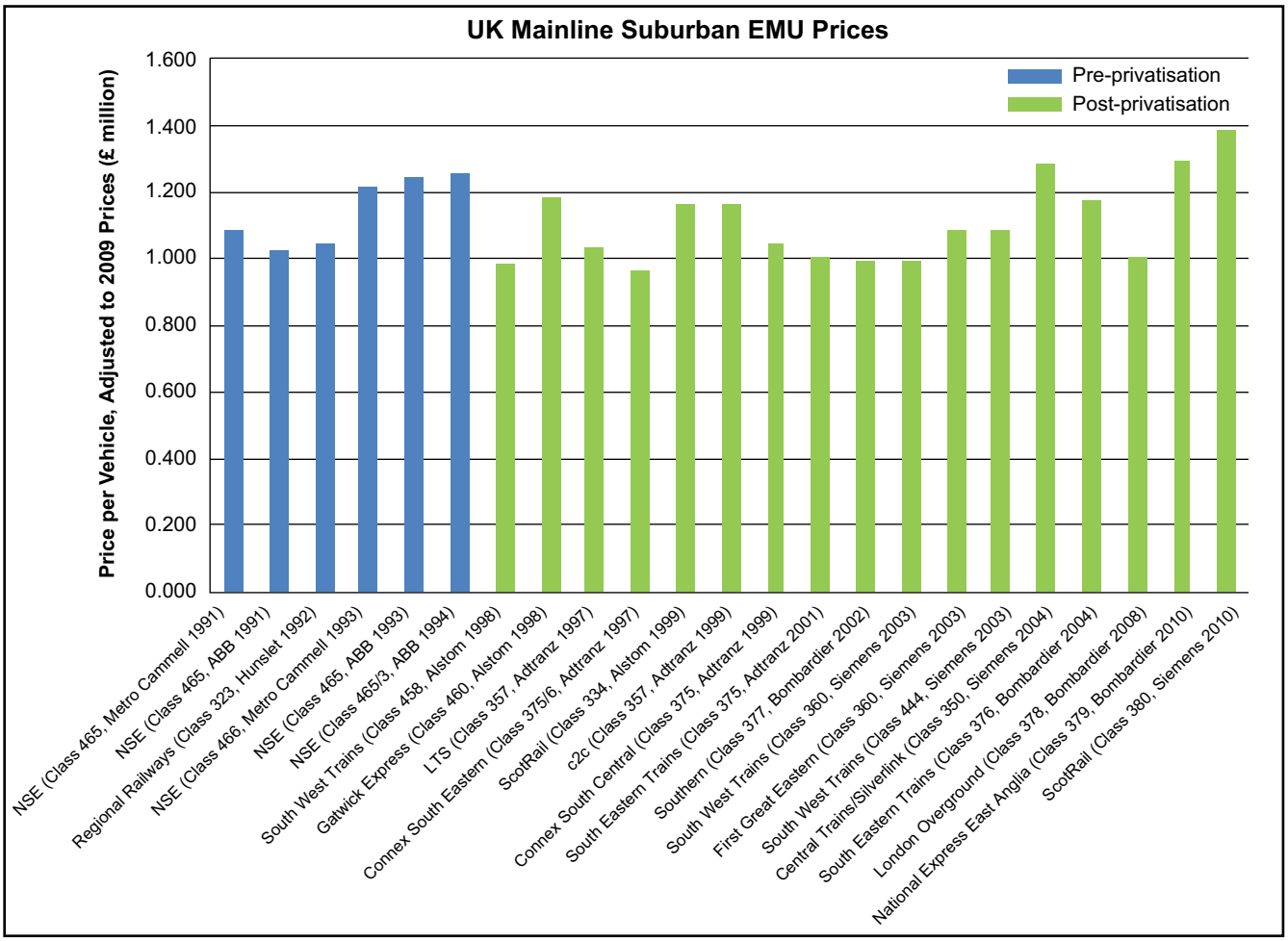


Source: Arup.

14.3.3 Initial procurement costs

Overall initial procurement costs for rolling stock have shown a slight growth in real terms since privatisation. This is similar to growth in aircraft and car purchase costs (see Figure 14.3). (Note, the following figures have not been adjusted for changes in exchange rates or differences in specification.)

Figure 14.3: UK mainline suburban EMU prices



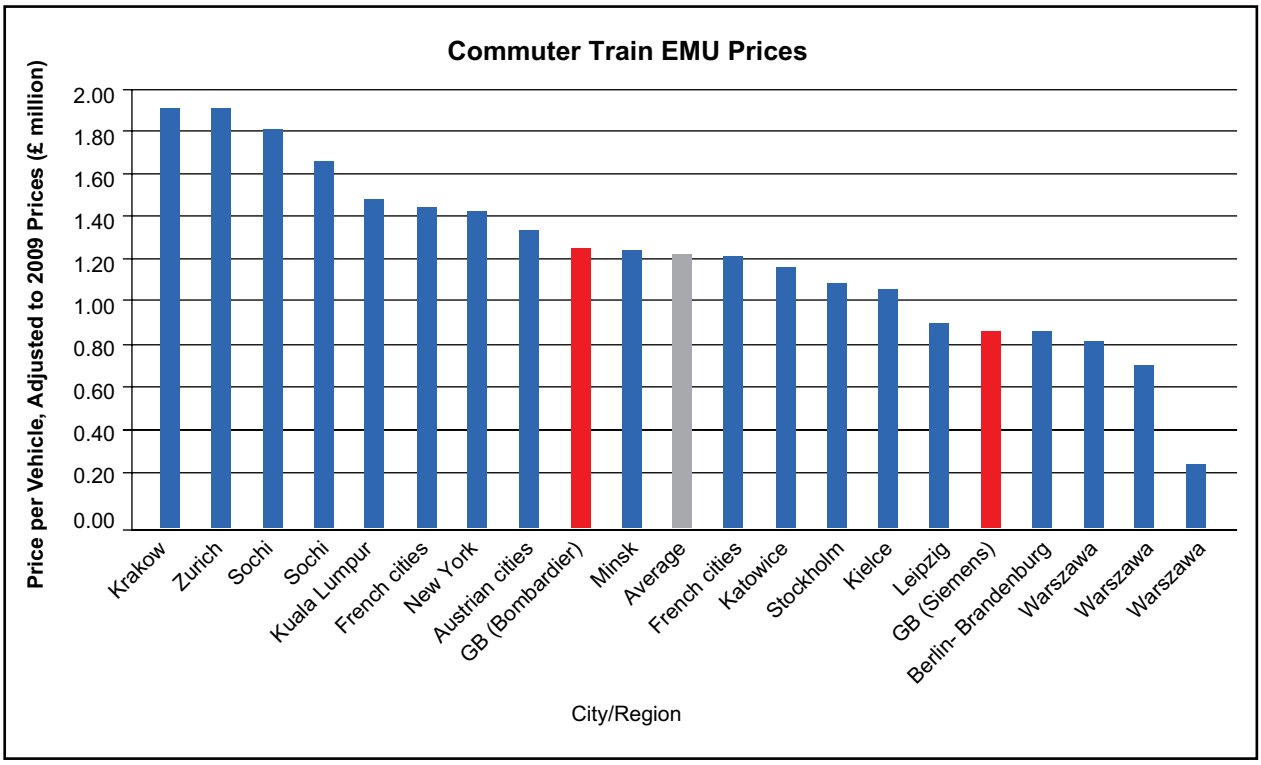
Source: Arup.

This cost increase partly reflects the shift to optimise rolling stock on a whole-system, whole-life and per-seat basis. For example, the Class 380s (a suburban EMU) unit cost is the highest initial procurement cost in Figure 14.3. However, compared with a Class 350, each Class 380 unit has 15% more seating capacity, is lighter (reducing track damage and energy costs) and is the first "fly by wire"[93] train for GB rail.

More useful is the comparison of international EMU and DMU prices. The unit costs shown in Figure 14.4 for the GB EMU orders are 22% greater than the lowest unit cost observed elsewhere (excluding the outlier at the extreme right of the chart).

93 With electronic connections between the driver's controls and the train's traction and braking systems.

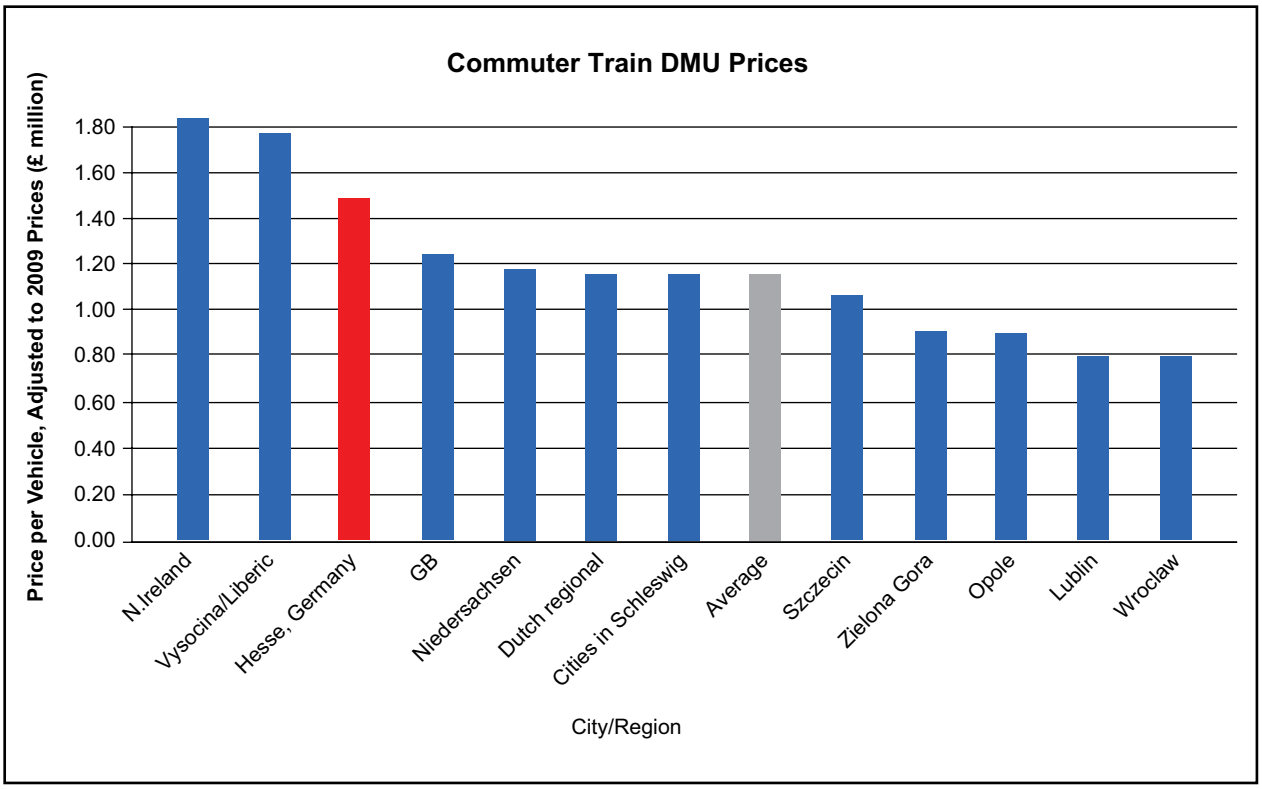
Figure 14.4: Commuter train EMU prices



Source: Arup.

For DMUs, GB costs are significantly (around a third) above the average observed for the group and around twice as high as the unit cost for the cheapest comparators observed (see Figure 14.5).

Figure 14.5: Commuter train DMU prices



Source: Arup.

14.3.4 ROSCO leasing costs

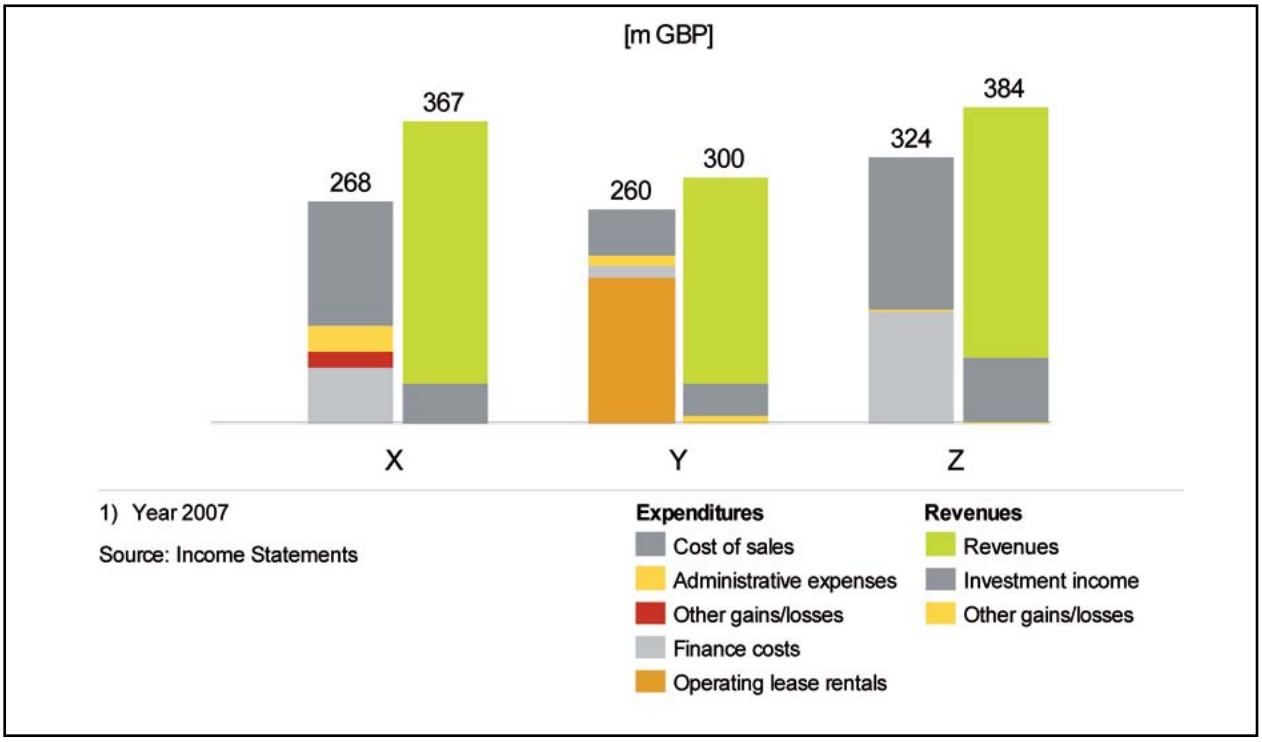
Atkins estimated that GB leasing costs were about £1bn in financial year 2009/10, which equates to 8% of total GB rail costs.

Concerns over re-leasing costs led to a review by the Competition Commission (CC) of the rolling stock leasing market between 2007 and 2009. The review concluded that there were "features of the market which ... prevent, restrict or distort competition in connection with the leasing of rolling stock". Such features included the shortage of alternative rolling stock available to TOCs when bidding for franchises, weakened incentives on ROSCOs to compete on lease rentals of used rolling stock, plus significant barriers to entry into the leasing market. The effects of these features may well be seen in the fact that capital rentals remained relatively constant in the period 1995–2005 despite declining interest rates and reducing risk premiums in relevant markets.

The CC recommended changes to the franchise system, ROSCO codes of practice and improved pricing visibility between TOCs and ROSCOs. The bulk of the recommendations are now being implemented. At this stage, it is too early to be certain whether or not the remedies put forward by the CC will be effective.

Civity's assessment of ROSCO margins (Figure 14.6) suggests that all three ROSCOs were profitable in 2007, as shown in Figure 14.6, with between 12% and 37% operating profit margin for the year.

Figure 14.6: Civity's analysis of ROSCO margins



ROSCOs have stated that their performance was driven by:

- good asset management (e.g. increasing rolling stock life beyond the 30 years assumed at privatisation);
- good supply chain management (e.g. developing new suppliers where they felt competition was weak); and

- historically low cost of capital – this has enabled them to take their risk contingency as profit.

14.3.5 Rolling stock – procurement and programme management

Arup assessed that between 6% and 12% of rolling stock costs are spent before production begins, and that decisions made by this point drive the whole-life cost of the rolling stock. This aligns with the International Council on Systems Engineering's (INCOSE) assessment of the cost of fixing errors, shown in Table 14.2.

Table 14.2: INCOSE UK assessment of the cost of fixing errors

	System cost factors
Requirements	x 1 (reference)
Design	x 5
Build	x 12
Test	x 40
Operations	x 250

The rolling stock procurement process itself can add cost, time and risk. For example:

- according to the RIA and one rolling stock manufacturer, significant costs are incurred through the procurement processes, ranging from £500k for a simple follow on order through to £15m for a complex major project; and
- delays, consequent escalation costs and specification changes have contributed to the escalation of procurement costs for some rolling stock. One TOC owning group noted that orders for Electrostar trains were quoted at £1.1m per vehicle, with follow-on orders as low as £0.78m per vehicle. Delays in obtaining a decision from the DfT resulted in this option price lapsing, and the eventual price paid was £1.25m per vehicle.

14.3.6 Boom and bust procurement volumes

Figure 14.7 shows the significant levels of volatility in GB rolling stock orders since privatisation.

Figure 14.7: Rolling stock orders by year

Rolling stock manufacturers have stated that this volatility increases risk and costs to their business by between 10% and 20%:

- Arup's analysis suggested that costs per vehicle can be between 20% and 60% higher for orders of less than 200 vehicles because of non-recurring costs and the inability to get full benefit from the learning curve.

14.4 Barriers to efficiency

The main barriers to reducing supply chain costs were found to be as follows:

- **Limited cost pressure at re-lease**. There is little genuine competition, or use of other approaches, such as partnering, to reduce rolling stock re-lease costs. Re-leasing is not a single market, but a series of separate markets that operate discontinuously around franchise replacement dates. Rolling stock is highly non-substitutable between franchises. There is almost no surplus stock on the network and a limited threat of new trains displacing old.
- **Interactions between franchising, rolling stock leasing and new rolling stock procurement are difficult to manage**. Interventions to improve one market (such as the requirement for ROSCOs to offer the same price to all potential franchisees) have implications on the other markets; similarly, the franchising process can prevent optimum approaches to new procurements and/or upgrades.
- **Management of new rolling stock procurement**. Rolling stock procurement is seen as relatively bureaucratic and is a costly and time-consuming process. Specifications for rolling stock have become increasingly prescriptive and detailed, reducing the potential for innovation

and increasing the overhead costs to both procurers and suppliers. Procurement patterns are stop-start which adds cost as rolling stock manufacturers are unable to make long-term decisions because they have no long-term confidence that orders will appear. This also limits their ability to apply lean or agile approaches to reduce costs.

- **Asset management of current assets**. The opportunity to life-extend the existing fleets does not appear to be being maximised. There is also a lack of comparable whole-life cost data and little equipment commonality across different train types.
- **Incentives for cost reduction**. ROSCOs are incentivised to reduce their costs to increase profits. However, the fact that the re-lease market is not fully competitive means that there are few incentives for them to pass savings on to TOCs. TOCs have little leverage over ROSCOs to reduce leasing prices, and generally treat leasing costs as a "pass through" cost to the DfT. The overhead costs of procurement processes do not impact the DfT directly, as the increased cost occurs downstream and indirectly through franchise costs;
- **Large number of vehicle and subsystem types**. Multiple franchises and low procurement volumes appear to have driven a high level of diversity in vehicle and sub-system types. This increases development, maintenance and spares costs as the industry has a large number of different equipment to support; and
- **Lack of modern partnering approaches to reduce costs**. The industry has a history of applying highly competitive, confrontational, procurement approaches that work well when there is a healthy market. However, there appears to be less understanding of what approaches to use when there is no effective market.

14.5 Principal issues

The principal issues that need to be addressed are as follows:

- **How to improve incentives for reducing the cost of rolling stock?** Current arrangements have weak incentives on ROSCOs to reduce re-lease costs. TOCs simply pass rolling stock re-lease costs through to the DfT, which has little ability to influence them.
- **How to increase cost pressure at re-lease?** This will either need to be through increased competition, some form of long-term partnering agreement or else introducing regulation into the market.
- **How to manage interactions between franchising, rolling stock leasing, and new rolling stock procurement?** This requires recognition that these markets are interconnected and that that they need to be optimised across the industry.
- **How to improve management of new rolling stock procurement?** Rolling stock procurement needs to align with wider industry strategy, with proper option evaluation before procurements are initiated. Once a new procurement is initiated, the cost and value of rolling stock need to be optimised on a whole-life, whole-system basis. Procurement needs to take a long-term view of the new rolling stock supply chain, seeking to reduce costs and increase the value of rolling stock. All of this needs to balance the need for an industry led, agile and innovative approach, with the need to protect value for money for Government.
- **How to reduce the number of rolling stock and sub-system types?** The aim would be to enable designers, maintainers and support engineers to reduce the amount of time spent learning about new sub-systems, to maximise buying power and hence reduce costs.

- **How to improve the asset management of current assets?** This is primarily about enabling existing asset owners to make optimum whole-life cost decisions with sufficient confidence. This includes extending existing rolling stock to its optimum asset life, which is potentially significantly longer than existing plans.

14.6 Recommendations for cost reduction

- **Increase standardisation of GB rolling stock**, by developing a set of open standards for the different rolling stock types and key cost driving equipment. These standards should be developed by industry (via the RSA) and the DfT, with the aim of both reducing whole-life costs and increasing innovation at the sub-system level.
- **More effective procurement of rolling stock**, by developing a significantly faster and less bureaucratic procurement approach which:
  - provides suppliers with better visibility on forward requirements, and recognises the advantages of less volatile production flows;
  - starts with thorough analysis at a strategic level of options for the equipment solution, for the procurement approach, and for the interaction with the franchising system;
  - optimises rolling stock costs on a whole-life, whole-system basis;
  - engages and, as appropriate, incentivises TOCs to help find lower-cost solutions to rolling stock requirements;
  - recognises the advantages of early engagement of prospective suppliers; and
  - reflects the drive for standardisation.
- **Improving value for money from the leasing market**. As mentioned earlier, it is too early at this stage to be sure what will be the full effect of the CC remedies. However, the Study finds it difficult to understand how these remedies will give the DfT all the information required to satisfy itself that rates on re-leases are value for money. Accordingly, the Study recommends that:
  - the DfT should explore the possibility of establishing strategic partnering arrangements with the ROSCOs, which commit the ROSCOs to offering rates on re-leases that are demonstrably value for money, and which ensure that the DfT obtains sufficient information to be satisfied that this is the case;
  - such arrangement might also include enhanced assurance to the ROSCOs regarding the future use of rolling stock; and
  - if there continued to be problems with re-lease rates, and efforts to establish such strategic partnering arrangements with the ROSCOs proved to be unsuccessful, the DfT should consider introducing regulation of fair rates of return to the ROSCOs; the DfT could also explore, at a later date, options for establishing new privately-financed vehicles to procure and hold rolling stock in the public interest, recognising that rolling stock, after initial procurement, is always going to stay in the GB rail system in the long term.

Box 14.1 Strategic partnering and alliancing in rail and other industries

Strategic partnering has been used in a range of other sectors, where it has been used to deliver significant reductions in cost while improving safety, performance and customer satisfaction.

Good strategic partnering is based upon a long-term collaborative relationship with proportionate sharing of costs, profits and risks. It requires a joint focus on reducing costs and increasing value, by identifying waste, removing over-specification of work, reducing overheads and greater long-term investment in plant, improved processes or people.

Partnering is only one of a range of approaches to securing value for money. It is, however, ideally suited to situations where the market is not really effective or where goods or services are critical. Examples include:

- MOD/Augusta Westland, which reduced the cost of supporting helicopters by 23% over five years;
- Virgin/Alstom trains, which delivered 15% more train availability at 15% lower cost;
- NR, which is rolling out a new partnering framework to programme delivery, the first phase of which will cover £6bn programmes over the next five years; and
- several ROSCOs are partnering with some of their suppliers to reduce their costs.

14.7 Potential for, and timings of, cost savings

Overall, the Study has concluded that savings can be achieved in rolling stock procurement, asset management and re-leasing. The cost benefits of improved rolling stock management could come from:

- better procurement;
- improved rates on re-leases;
- life extension of current fleets, where appropriate;
- improved efficiency through better long-term planning; and
- stable policy and standardisation.

These benefits are almost all "double-counted" with the asset management, programme management and supply chain management savings.

The earlier an effective rolling stock supply chain management function can be established, the faster the savings can accrue.

14.8 Implementation plan

Implementing these improvements requires the establishment of a suitably qualified and experienced implementation team.

Specific short-term actions include:

- industry (via the RSA) and the DfT to develop a set of open standards for rolling stock;
- the DfT to overhaul the rolling stock procurement approach along the lines set out above, reducing the costs and time to market; and
- the DfT and the ROSCOs to develop long-term partnering agreements for the management of GB rolling stock.

15. Infrastructure management

15.1 Infrastructure management and Network Rail

This section reviews current and planned approaches to managing GB rail infrastructure. Network Rail (NR) is accountable for the management of the GB rail infrastructure, regulated by the Office of Rail Regulation (ORR) and funded largely through grants from the Department for Transport (DfT) and track access charges.

Any assessment of the management of the infrastructure is therefore an assessment of NR's performance and, to a lesser extent, of the ability of the ORR and DfT to both enable and ensure that NR delivers an efficient and safe infrastructure.

The Study has undertaken a high-level review of:

- existing comparisons of NR's performance against other railways; and
- NR's Transformation Programme, both in terms of coverage and likelihood of success.

15.2 NR's performance compared with other railways

The ORR benchmarked NR's performance against a wide range of comparators, including a mixture of European and North American railways between 2006 and 2007. This assessment of NR's cost performance, included in the 2008 Periodic Review, concluded that there was a likely 30–40% efficiency gap for maintenance and renewal costs. The ORR's indicative 10-year efficiency trajectory for Control Period 4 (CP4) and CP5 (up to 2019) should substantially close this efficiency gap for infrastructure costs in GB rail. This would bring NR level with the comparator rail organisations used in the ORR benchmarking study.

However, there is still likely to be a further efficiency gap considering that the comparator railways are not generally private-sector leading-edge companies, but are largely state owned or only part-privatised organisations, not subject to strong private-sector financial incentives.

In terms of wider benchmarking, not much non-rail infrastructure benchmarking has been done, probably due to the difficulty in translating activity-based efficiencies to the rail environment (where service visibility is high, asset type diversity is high, assets are geographically dispersed and safety requirements are high). In 2008, the ORR commissioned Oxera to assess the scope for CP4 efficiency improvements with reference to typical ongoing efficiency improvements that privatised utility companies achieve. Building on this, the Study's "should cost" work indicated that infrastructure management was lagging behind the improvement rates set by other privatised utilities. The Study has shown that non-rail benchmarks are very helpful, and will become increasingly important if GB rail's efficiency in managing infrastructure is to match best-practice.

Notwithstanding the current efficiency gap, NR's performance since it was formed in 2003 has had some notable successes, primarily in recovering from the Hatfield derailment and the subsequent rapid escalation in costs and poor performance. Specifically:

- over the last five years NR has delivered a 33%[94] reduction in infrastructure-caused delay minutes in the context of growing traffic volumes; and
- in the five years to 2008/09 (CP3), NR reduced overall Operation, Maintenance and Renewals (OM&R) costs by 27% compared with the ORR target of 31%. The limited unit cost data available at the time showed that at least 20% of this efficiency was through unit cost reduction.

15.3 Network Rail's Transformation Programme

At the start of the current control period in 2009/10, NR embarked on its Transformation Programme in order to:

- achieve the efficiency improvement targets set by the ORR for CP4;
- transform "how" it does things as well as "what" it does, increasing the focus on the service provided to rail users, customers and other stakeholders; and
- provide a strong foundation for longer-term sustainable improvements in affordability and value for money.

Two workstreams aim to make it more responsive, flexible, innovative, transparent and decisive. These are the service culture and organisational effectiveness workstreams. They will impact upon all of NR's activity in CP4.

A further four workstreams address "what" it does and will examine opportunities to develop plans such that it can deliver the outputs more cost-effectively. These are:

- asset policy;
- asset information;
- efficient infrastructure delivery; and
- network operations.

The Transformation Programme includes a central programme office and communications workstream. The supporting workstreams, which span the Transformation Programme, are needed to ensure that NR has a consistent approach to its people, processes and use of technology.

15.4 Challenges for CP4 and CP5

Through desktop review, meetings and consultant reviews, the Study noted that the Transformation Programme is a very challenging agenda, specifically to push through so many changes, embed them in a large organisation, and then realise the benefits within five years.

94 NR Annual Return 2010, p. 20, Table 1.12, 2004/05–2009/10 top two rows.

This would be difficult for any organisation. The efficiency challenges for NR are particularly acute because:

- its track record at delivering improvements is perceived to be poor, particularly on driving though the necessary culture and behavioural changes throughout the organisation and realising the benefits – there are examples of recurring issues that have still not yet been tackled adequately;
- significant industrial relations issues and high public visibility may make improvements hard to achieve;
- some of the CP4 objectives present NR with difficult tensions, for example targets to reduce disruptive engineering access while delivering a greater volume of complex enhancement programmes, at a reduced cost; and
- the efficiencies in CP4 will be harder to achieve than those already gained in CP3, and therefore will need extra effort or a change in approach.

15.5 Assessing the likelihood of success

The Study commissioned work to get an objective view of whether NR's current plans within the Transformation Programme are likely to succeed in tackling areas that have long been reported as difficult barriers to reducing costs.

The Study asked Adventis to:

- understand the broad scope of NR's Transformation Programme, comparing it with a best-practice framework and a benchmarked example;
- assess the extent that its constituent workstreams are addressing areas that have been noted as issues over the last 10 years; and
- assess the degree of challenge it represents for the company and give a view on its likelihood of success.

15.6 Findings

The review compared reports on NR (and Railtrack, its predecessor) dating from 2000 up to and including papers on the current Transformation Programme. Also, the current Transformation Programme was compared against a best-practice framework and a recent similar change programme in the Highways Agency.

Reports used for the assessment comprised:

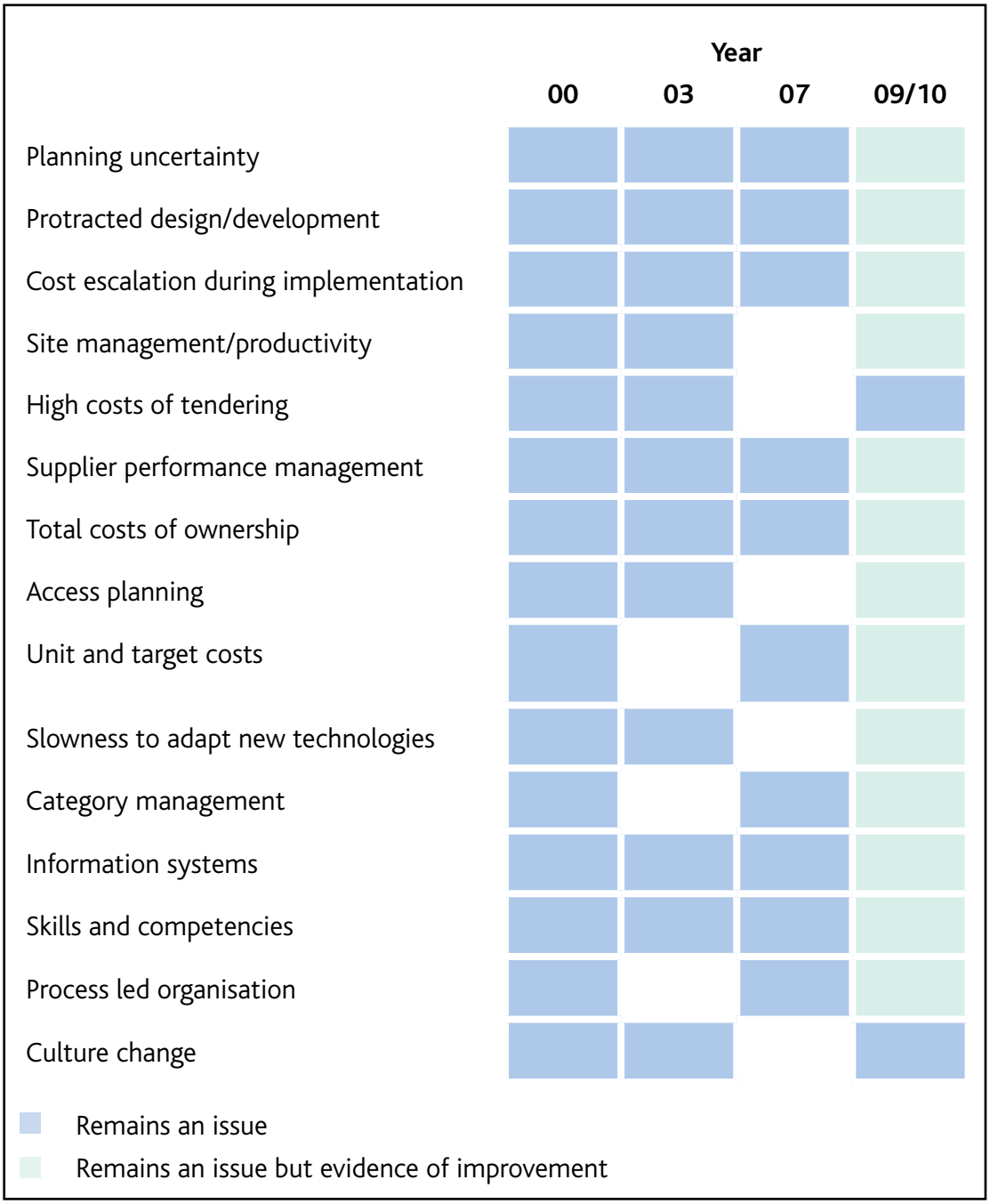
- McKinsey and Company (2000) *Supply Chain Management Project*;
- Accenture (2003) *Review of NR's Supply Chain*;
- AT Kearney (2007) *CP4 Procurement Opportunity Assessment*;
- AMCL (2007) *Best Practice Review*;
- AMCL (2009) *Best Practice Review Update*;
- AT Kearney (2010) *Assessment of Excellence in Procurement*; and

- Atkins (2011) *Asset Management and Supply Chain Management Assessment of GB Rail*.

Within these reports, there were many examples of issues that have been repeatedly highlighted over the last 10 years, but still present a major opportunity for NR. These are illustrated in Figure 15.1 and include issues such as the high cost of tendering, slowness in rolling out new technologies, protracted design, planning uncertainty and supplier management weaknesses.

Figure 15.1: Issue timeline for NR improvement initiatives

Planning uncertainty



Source: Adventis.

In its report, Adventis noted:

> *"The Efficient Project Governance strand [of the Transformation Programme] aims to achieve faster slicker end-to-end processes, reduced bureaucracy, avoidance of man-marking and excessive reporting, better process compliance, reduced contractor overheads, reduced uncontrolled project scope changes and reduced claims. These were all highlighted in the earliest reports [dating back to 2000]."*

However, as can be seen from Figure 15.1, the pace of change since 2008 appears to have changed for the better. In its report, Adventis commented that:

> *"From our review of previous reports, the Transformation Programme is tackling all of the main issues facing NR. It also compares favourably with our best practice change enablement framework. It is well conceived, well structured and comprehensive. It is also making good progress.*
>
> *It could be argued that some of the toughest challenges are still to come. In particular, re-designing very complex and involved processes and permanently changing behaviour and culture at the coal face. However, that is not to devalue the good work achieved to date.*
>
> *The Transformation Programme is being done in a similar way to our benchmark example in the Highways Authority (HA). The main difference is that the HA programme seems to present a more forceful and tougher approach. For example, there is more evidence of people being evaluated and replaced where necessary. Also, stretching target costs have been developed and imposed on suppliers in order to force innovation and collaboration.*
>
> *We raise this point as a constructive comment. It is up to the Directors and Managers of NR to set the right tone for the Transformation Programme according to their more detailed knowledge of the organisation and its people."*

Overall, the Adventis work concluded the following:

> *"The current management of NR, including the outgoing CEO, have made good progress in tackling many complex supply chain and investment delivery challenges. Looking ahead, the Transformation Programme is well conceived and is tackling the right issues. If it continues in the way it has been going, there is a high likelihood of success.*
>
> *Having said that, some of the toughest challenges are, arguably, yet to come. In particular, re-designing complex processes and changing behaviours and culture at the coal face. We agree with NR that culture change is essential to achieve its business objectives.*
>
> *For this to happen quickly enough NR may need to adopt a more forceful stance. The Transformation Programme has been presented in an inclusive way that invites people to make the change happen. However, it would be unusual if everyone was able to adapt to the new demands.*
>
> *To achieve its targets NR may have to replace those that are not willing or able to change, including employees and suppliers. While there is evidence of this happening at the early stages of NR's existence, more work is needed to investigate this aspect of the Transformation Programme more fully.*
>
> *There are also risks to be managed. In particular the outgoing CEO was synonymous with the programme and the baton needs to be passed on seamlessly. We have been assured by NR that this is happening and the new CEO fully supports the Transformation Programme.*

Responsibility for the change has passed from the CEO and Corporate Development Director to the Operational Directors. NR needs to avoid any sense that the 'work is done'.

The new vision for the business needs to be dovetailed with the move to a decentralised structure. Management need to demonstrate how the two initiatives are aligned to prevent people from abandoning the 'promise and principles'.

Many of the supply chain and investment delivery issues being tackled by the Transformation Programme were identified over 10 years ago. Much of the progress that has been made has been achieved in the past three years. This may be because NR were working on other priorities, such as bringing the maintenance organisation in-house. It may also be a result of cumulative efforts up to then. Either way, NR cannot allow the pace of improvement to drop back to the 10 year average."

15.7 Overall conclusions

There are a large number of complex systems issues that NR and its predecessor Railtrack have been working on for over 10 years. However, the pace of improvement has quickened since 2008 and the current Transformation Programme is maintaining that trend, and is doing a lot to change the behaviours and culture of its employees.

In terms of technical coverage, there is generally a strong synergy between the aspirations of the Transformation Programme and the Study, particularly in the asset management and supply chain management areas.

The Transformation Programme is well conceived and is tackling the right issues. If it continues in the way it has been going there is a high likelihood of success.

An area of concern raised several times during the Study is how NR's recent move to decentralisation, coupled with a change of senior management, aligns with the Transformation Programme.

The move to decentralisation is clearly aligned with the findings of the Study, and although elements of the Transformation Programme may need to be adapted to reflect the new approach, the Study considers that the closer working between NR and Train Operating Companies (TOCs), coupled with the closer alignment of incentives, should accelerate many of the necessary changes.

It is important that NR can quickly demonstrate to its staff how the Transformation Programme aligns with the move to devolution to prevent its staff being distracted or abandoning the efficiency initiatives it has already started.

16. Information systems

16.1 Introduction

Information Systems (IS) touch every part of the GB rail industry and are both an enabler of, and barrier to, value for money. At their best, high-quality information systems support rapid and accurate decision-making; at their worst, information systems drain money from the industry and encourage silo thinking and management. In this section the Study considers:

- the GB rail industry's IS today;
- potential solutions to the GB rail industry's IS legacy;
- using IS to achieve value for money;
- a wider vision; and
- capturing new opportunities.

16.2 Executive summary

The Study has found that the effectiveness of the industry's IS is inhibited by a suite of legacy systems that are expensive to run, unable to communicate with new technology and encourage users to develop a wide range of bespoke local systems to overcome limitations. Many legacy systems were created and managed in company silos, with only a few systems crossing industry boundaries.

Where there is an urgent requirement for consistent and up-to-date information, such as that relayed to the passenger, the industry often fails to provide current and accurate advice, especially at times of disruption.

The Study has identified a lack of system-wide leadership in this, as well as other areas, and recommends that excellence in IS can be driven by a Rail Systems Agency (RSA) while still leaving room for local IS solutions where they are appropriate.

There are many existing activities in the GB rail industry where value for money could be obtained from a co-operative approach to IS. The quantity and variety of new IS solutions are extensive and the Study received submissions highlighting opportunities for cost reduction, competitive advantage and new products. The Study recommends using its proposed approach to innovation to capture these new opportunities.

16.3 The GB rail industry's information systems today

16.3.1 Perceptions of the GB rail industry's approach to Information Systems

Across the GB rail industry there is consensus that the legacy IS, some dating back to the very earliest days of computerisation, are preventing the railway from developing its IS capability and embracing new IS technology.

The problems were highlighted in research by one of the industry's major players, which found that in one area of its business there were 145 applications used in core activities. Many of the applications were of 1970s heritage and were designed for a single, vertically-integrated railway.

Across the railway there are 1,700 national information systems used by the GB rail industry, of which 1,500 are managed by Network Rail (NR).[95] The Study was told that many systems were felt to be inflexible, intertwined and increasingly difficult to maintain and enhance. This has resulted in additional (rather than replacement) applications and business practices being implemented to plug the gaps and to support the emerging devolved rail industry model.

Existing systems that support business activities rely heavily on local knowledge and manual effort. Despite the number of bespoke applications designed to meet a particular need, there continues to be difficulty in obtaining accurate, joined-up information about train operations.

16.3.2 Passenger information

Passenger information is a particular problem facing the rail industry. The diagnosis of the problem encapsulates the overall IS problems in the industry.

This area has been the subject of extensive research, including a report produced by AECOM for the Department for Transport (DfT) in January 2010,[96] which identified the following systems and technology issues:

- a lack of common data exchange standards;
- extensive manual system interfaces – reliance on operators inputting data into systems manually;
- passenger information systems that rely on local information rather than route-based data, resulting in inaccurate real-time information (particularly during delays);
- lack of integration between track/platform and on-board information systems with regard to passenger information;
- communication between control centres and drivers/train managers is not dedicated, particularly during delays, and is limited in terms of volume, usefulness and timeliness; and

95 Research by the Rail Safety and Standards Board (RSSB) for the Technical Strategy Leadership Group (TSLG).
96 AECOM (2010) *Integrated Passenger Information: Delivering the Rail End to End Journey, Stage 3 Report*. London: Department for Transport.

- journey planners do not, in the main, use real-time data and therefore are only reliable if transportation modes comply with the timetable and significant delays do not occur.

The solutions proposed for improving passenger information form a check-list for IS across the rail industry:

- the industry will have to embrace a level of maturity, so that industry players overcome their reluctance to give up their own systems – a reluctance that negates the ability to move towards a single source;
- making passenger information consistent across all media, whether on or off the railway network, will require the industry to buy in to consolidated processes and to work in a consistent fashion; and
- train detection systems will have to provide information at the right level of granularity – there are multiple ways in which information can enter the core systems and this is not necessarily done in a consistent or timely fashion.

Specific requirements relating to passenger information systems were:

- open and common standards and data dictionaries to enable exchange of data across all IS;
- eliminate or reduce manual interfaces where operators enter data into multiple systems;
- a streamlined and efficient common technical architecture that supports business processes and data flows, where updates made by a stakeholder in a particular system automatically change the source data, which in turn updates other systems; and
- connecting the on-board information systems with the track and station architecture so that the on-board system is updated by both information sources and information is validated before it is communicated to passengers.

16.3.3 The cost of IS

NR's IS expenditure is approximately £160m a year.

Train Operating Company (TOC) Owning Groups stated that TOC IS costs were between £4m and £16m a year, although this excluded additional costs where corporate IS expenditure was incurred at Group level. Taken with the Freight Operating Companies (FOCs), the Study has estimated that total annual train operator IS expenditure is £190m a year.

In the absence of a single published figure for IS expenditure in the GB rail industry, the Study estimates that the total annual industry cost of operational IS is at least £350m. The Study has not been able to estimate the cost to the industry of the inefficiency of its inadequate and antiquated systems.

16.4 Potential solutions to the GB rail industry's IS legacy

Just because a collection of businesses and organisations are all doing the same thing, moving passengers and freight by rail, does not mean that they should all be using the same IS. Complete standardisation of processes and activities may be possible in a single company environment, or in

conditions of rigid central control, but neither of these circumstances apply to the GB rail industry and nor do they have to.

The Study found that successful industries, such as aerospace, major supermarkets and retail banks, adopt a number of key IS principles. Where there was interface between different parts of the industry, a common communications protocol was agreed or, if necessary, imposed. Information systems, like management, have a tendency to build layers. Successful companies and industries stripped out these layers when simplifying systems architecture.

The need to manage with legacy systems is not unique to the GB rail industry. Well co-ordinated industries agree to tackle the systems architecture a chunk at a time, and build a parallel operation that is switched over when fully tested and accepted, and do not give up in the face of adversity.

The Study also found that a common factor in other organisations was a leader, leadership or leadership group that appreciated the importance of fit-for-purpose information systems and drove change to existing systems. Leadership groups do not need to have technical expertise in IS, but do need to have an appreciation of how IS would provide competitive advantage by providing access to new markets, enabling cost reduction or improving customer service.

The Study recognises that there are certain systems and outputs that relate to only part of the industry and should be managed accordingly. Even these systems, however, have multiple interfaces with national systems and need to be compliant with a system-wide IS architecture.

It is not for the Study to identify exactly which systems should be replaced, although the Study has identified some specific value for money opportunities. The Study does recommend that technological expertise in cross-industry IS issues could be brought together within the Rail Systems Agency (RSA). The RSA would prioritise the replacement of the architecture for those systems that have an industry-wide application and would develop a replacement for the current governance structure for the industry, known as the Systems Code, which is seen as protecting the status quo rather than promoting change.

16.5 Using IS to achieve value for money

Notwithstanding the criticisms of the GB rail industry's current use and cost of IS, the industry and its supply base have a plethora of ideas that would improve the industry's value for money. The major shortcoming in this set of ideas is that, while the benefits can be described in qualitative terms, the understanding of financial benefits (and costs) is scarce.

16.5.1 Performance management and delay attribution

Delay attribution is a mechanism by which the industry apportions costs owing to delays or disruptions. While there will always be a need for a performance measurement and analysis system combined with a mechanism to determine root causes of delay, the current approach that involves over 600 people in this task is not value for money.

The industry should introduce an automated performance measurement system utilising new IS architecture or build a new system to operate alongside, and eventually replace, the historic Train Running System (TRUST) and Total Operations Processing System (TOPS).

Previous work undertaken by NR estimated that annual cost savings from one specific initiative in this area would be £3m, but the company anticipates a significantly greater benefit from an industry-wide approach, including an unquantified additional benefit from improved performance.

16.5.2 Introduction of shared systems

Significant progress has been made in co-locating NR and operating company control centre activities, improving both communications and railway performance. In almost all cases, multiple IS systems are used, supported by different data networks for each operator. In essence, people are co-located, but their IS operates in silos.

A value for money solution would be the removal of duplicated systems, simplifying the support and the costs to run the services. Additional benefits would include the ability to standardise on working processes and procedures, thus ensuring best-practice and consistency of operations across the industry.

16.5.3 Telephony

All companies and support organisations in the GB rail industry require data and telephone networks for communications – both for internal and external purposes. The development and exploitation of telephony is regarded by many suppliers to the industry as a significant opportunity to improve value for money, and is an area where the industry has shown a willingness to embrace new thinking.

NR is currently upgrading 16,000km of telecoms cable route, and the installation of a completely new network of fibre optic and copper cabling. Completion is planned for 2015. This network could be further exploited for a number of applications, including revenue generation. Sale or lease of all or part of the network to a third party could generate additional efficiency opportunities.

16.6 A wider vision

The GB rail industry needs a vision for how it uses and exploits IS. The Study is not in a position to articulate that vision – this could be a role for the RSA. A starting point could be the vision described in a 2009 document published by IBM, *The Smarter Railroad, An Opportunity for the Railroad Industry*:

> *"The smarter railroad requires an intelligence that is networked, communicating and aware across the rail ecosystem. It requires information to be shared across the enterprise and among many different stakeholders, including the rail company, shippers, car owners, travel agents, municipalities, intermodal carriers and customers.*
>
> *With the proliferation of mobile and smart devices, customers are becoming more informed and want more control of their travel, shopping and interaction with railroads. In the future, it will matter less which company gets them from point A to point B; they will care more about how quick, cost-effective or easy it was to plan and manage the journey. Similarly, suppliers will want to book their own freight and have it moved directly from manufacturing to stores, regardless of carrier. They will self select their transit options by cost, efficiency and impact to the environment as required by their customers. Railroads will need to develop new networks across ecosystems and channels as a result of advanced network technologies and increasing customer demands."*[97]

There is no shortage of opportunities for the GB rail industry to realise such a vision.

97 Dierkx, K. (2009) *The Smarter Railroad: An Opportunity for the Railroad Industry*. IBM.

16.6.1 Next generation telephony

The Fixed Telecoms Network is only one part of a number of developments in communications technology. Alcatel-Lucent highlighted the potential for the use of wireless broadband communication through a technology known as Long-term Evolution or LTE, which is also an initiative being promoted by the Technology Strategy Leadership Group (TSLG).

Its application will be in the deployment of Global System for Mobile Communications–Railway (GSM-R) technology for signalling data, the deployment of radio systems and the use of Mobile Network Operators for applications enabling passenger internet connectivity.

16.6.2 Shared services

The use of a shared services platform could reduce the overhead costs of providing basic IS. The platform does not need to be provided from within the industry. It could be provided by an external supplier, but overseen by the RSA.

16.6.3 Information systems on the move

Use of sensors, monitors and tracking devices are increasingly essential to the management of fixed and mobile assets. Remote diagnostics and real-time monitoring is now a fact of life, while the proliferation of handheld devices is changing the way in which information is used and exploited.

Invensys has highlighted the application of handheld communication devices in the testing of modular signalling:

> "*All activities are controlled using handheld terminals which use a range of communications with a central server and back office software. Radio Frequency Identity (RFID) and bar code readers are built in to these devices to allow objects to be identified. Processes, procedures and supporting information are downloaded into the devices, and the installer or tester (and later maintainer) then follows the instruction given on the device.*
>
> *Savings accrue not just from the changes in the design, test, installation, standardisation and modularisation of equipment, but also from significantly reduced project durations, reduced time on site, reduced needs for civil works – specifically foundations and supporting structures – and reduced heating, lighting and environmental control equipment.*"[98]

Extending the use of handheld devices to provide real-time information to the industry's workforce and allowing rapid updating of information would be one way of dealing with criticisms of the industry's lack of responsiveness.

16.6.4 Asset management

Key to achieving asset management cost savings is the management of asset information. Up-to-date and predictive asset information enables the asset manager to balance performance, costs and safety.

The effective management of asset information needs to:

- closely support local railways' asset and supply-chain management decision-making;

98 Invensys: On track to saving £200m a year (2010, Invensys)

- support comparative benchmarking between different regional infrastructure managers;
- inform high-level decision-making on policy and strategy; and
- help drive safety and reliability improvements.

This requires a careful balance between central control and regional delegation. The centrally held core set of asset information should be the minimum necessary for assets requiring central management while avoiding additional costs for locally managed railways. The specification, capture, development, management and use of asset information and associated systems should be managed at local level, but with an obligation to share specific safety and reliability related data.

Asset information standards need to be agreed centrally. This will enable the making of national policy and strategy decisions, and the easy transfer of asset data at the end of rolling stock leases or infrastructure concessions, and will enable comparative regulation. This should be based upon an open international standard wherever possible.

16.6.5 Exploiting the retail opportunity

Information supplied by thetrainline.com showed that Great Britain has one of the highest levels of on-line penetration in commercial transactions, such as banking and retail, in Europe. In contrast, retail transactions in the GB rail sector have one of the lowest levels of on-line penetration, although it is increasing. The GB rail industry still uses traditional methods of retailing, in part driven by contractual obligations.

Supermarkets, the banking industry and other transport modes are exploiting the use of the internet and mobile communications in retail. In London the use of the Oyster card has transformed the time and effort involved in obtaining an authority to travel. The recognised technologies are:

- e-ticket, by which the customer prints his own ticket;
- m-ticket, where the authority to travel is held on a mobile device;
- Smartcard, where a card holds a pre-paid value available for travel on the network; and
- use of a debit/credit card for direct payment at the gate line.

All these options move away from the use of, and the costs of, issuing cardboard as the authority to travel. New systems will have costs associated with them. For example, the "e" and "m" options require barcode readers, while others need a card reader, but, overall, they represent a much more efficient means of granting authority to travel than traditional methods.

The exploitation of these opportunities is hampered by a lack of leadership, with the advocates of each option jostling for position while decision-makers struggle to obtain a consensus. Contractual issues limit the interoperability of any of the solutions.

The Study is not in a position to commend one electronic solution over another, but does recommend the adoption, where possible, of common retail interfaces that would allow the industry to catch up with other retail outlets in accelerating, modernising and reducing the cost of retail transactions.

16.6.6 Improving the operational control of the railway

Invensys has highlighted the benefit of using IS to improve operational control of the railway. Using IS to enable integrated and automated controls would permit major incident co-ordination, allowing remote control of lifts, escalators, ventilation and passenger information. Drawing on examples from overseas, Invensys has stated that this approach would reduce the number of operating staff, enable a one-third reduction in time to clear an incident, and would result in a control centre six to eight times smaller than a non-integrated approach.

Modern control technology is based on off-the-shelf computer and network technology, but UK standards limit the design of workstations and the information displayed on screens. Control systems technology can now allow the control of a large geographical area from a single centre. Single person controls are not tied to a fixed location, with the use of secure identity and log-on providing access to any workstation with the appropriate functionality, which means that control of the network can be configured to match the location and availability of skilled personnel.

16.7 Capturing new opportunities

The Study's review of the new opportunities in IS resonates with the Study's work on innovation generally. The failure of the industry to develop innovative IS is symptomatic of wider failures to innovate caused by fragmentation and silo thinking.

Recent initiatives by TSLG and NR have pointed the way to a more innovative environment, but the Study believes that the implementation of its recommendations for innovation, including the development of the RSA and the Rail Innovation and Growth Team (RIGT), will enable IS to be one of the earliest wins in a new, more innovative environment.

16.8 Conclusion

Information systems are at the heart of a more efficient railway that delivers value for money. Allowing the railway's existing IS to continue unreconstructed will increase cost, reduce efficiency and undermine customer service. In contrast, the replacement of legacy systems and the exploitation of new technology will generate improved value for money.

The RDG should encourage identification of opportunities where systems can be shared, including telecoms, and should ensure that national programmes are managed with maximum effectiveness, and take advantage of the most appropriate currently available technology. Cross-industry IS should be one of the primary responsibilities of the RSA.

17. Capacity management and utilisation

17.1 Introduction

As with any network, the use made of Britain's railway varies according to the level of demand and the way in which it accommodates that demand. The capability of the rail infrastructure to meet demand is determined by a number of variables, including signalling, train speed and the ability of stations and terminals to process the traffic.

The present system was constructed in the nineteenth century to meet the requirements of an economy reliant on primary industries and manufacturing, and where freight was the prime user of the network. In the twentieth century, passenger travel became more important and much of the expansion of the network was designed to accommodate commuter and long-distance traffic.

There are two key elements of capacity management and utilisation that this section deals with – train capacity/utilisation and network capacity/utilisation.

Train capacity is very much a function of the length and seating/standing configuration on each passenger train and represents the overall passenger-carrying capacity of the train. Train capacity utilisation (or train loading) reflects the efficient use that is made of this capacity in terms of the number of actual passengers being carried against the available capacity of the train. This is usually expressed in percentage terms, with 100% reflecting a train loading where all seats are utilised by passengers and figures above 100% reflecting a train where all the seats are occupied and additional passengers are standing (as a percentage of the seating capacity).

Network capacity is, however, a function of the capacity of the track and infrastructure to run trains, whatever length or individual train capacity they might represent. Network capacity is a function of a number of variables including line speed, conflicting routing of services, stopping patterns, but is driven primarily by the nature and type of signalling employed on that route. Network capacity utilisation is the degree to which this capacity is realised.

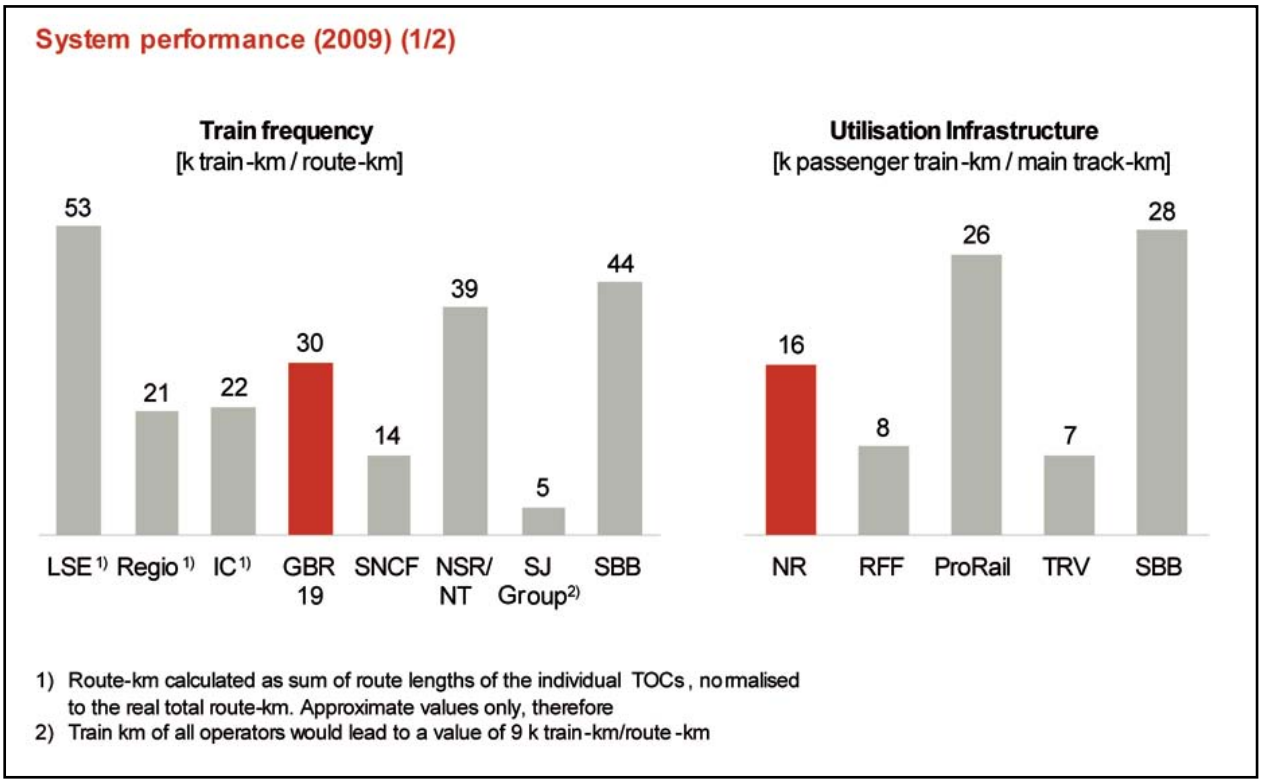
17.2 Summary of evidence from the Study's benchmarking work

The Study has considered a range of evidence on international benchmarking (see Section 4) and commissioned work from Civity that is summarised elsewhere. This has examined traffic density as well as load factors on passenger trains. From the evidence it appears that the British network is intensively used, although not as densely utilised as the Netherlands or Swiss networks, and that train loadings (the actual number of passengers on average on each train) are low compared with most European railways.

17.3 Comparison with European railways

The Civity report indicates that Britain's network utilisation averages 30 train-km per route km daily, with 16 passenger train-km per track-km. Other European railways achieve different levels of utilisation (in the context of Figure 17.1, the reference to "TOCs" should be read as "networks").

Figure 17.1: Switzerland and the Netherlands use their infrastructure more intensively than the UK



Source: Civity.

Although this demonstrates that other European countries are getting better utilisation of their networks, there are factors that go some way towards explaining the differences and these are listed below:

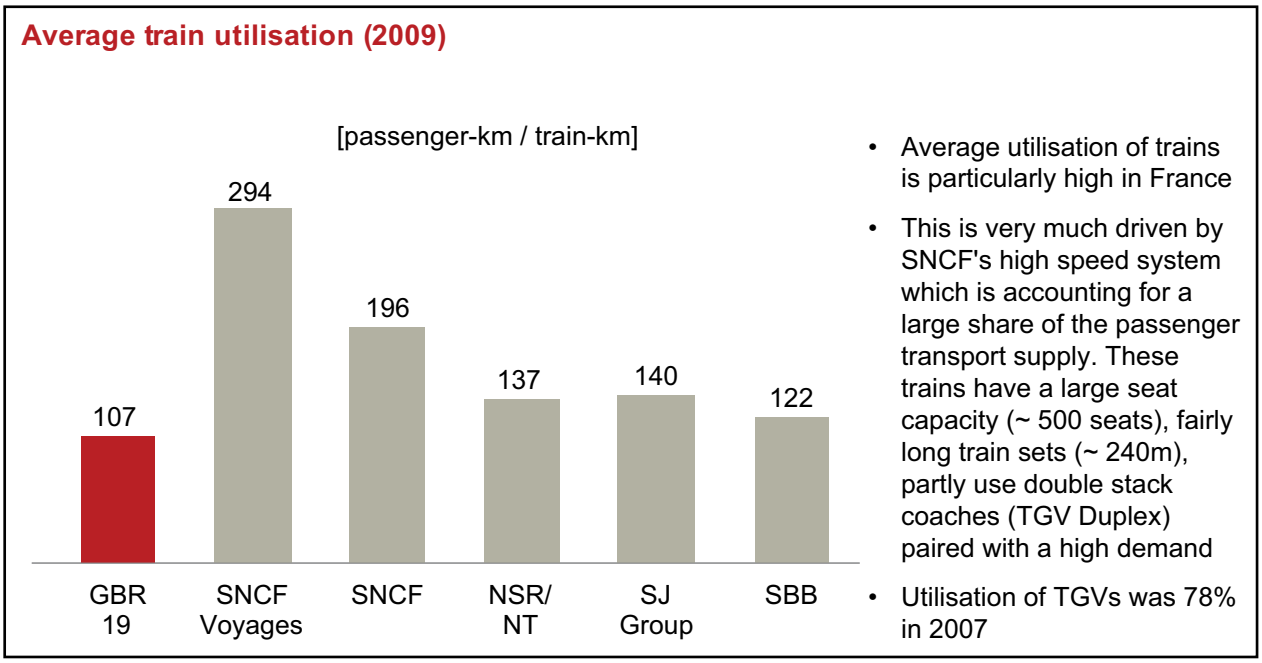
- geography and markets across Europe differ;
- distance between major centres, and the market mix between freight, long-distance passenger and commuter/regional flows, vary;
- the Swiss and Dutch networks both generate a significant volume of transit traffic, both passenger and freight, as well as being countries without a single dominant city;
- where distances are higher, and population densities lower, for example in France and Sweden, the density of traffic tends to be, on average, lower;
- many European countries integrate rail network planning with land use planning (mainly urban land use planning), leading to more optimal use of rail networks for planning purposes;

- averages conceal considerable variations within all countries – Britain's long-distance and regional networks have generally higher service frequencies than many European countries, although there is less freight traffic per route km in the UK than on most other networks; and
- there is an increasing tendency in Europe to have separate infrastructure for long-distance passenger, freight and regional/commuter services – in theory, this increases the capacity of the network to process more trains, as speed segregation provides more paths per hour.

17.4 How does the UK compare in terms of train utilisation?

Civity's analysis of average train utilisation provides further evidence that there are opportunities to build on European experience to improve productivity. Although the analysis does not take into account the total capacity of trains, it is clear that Britain's train utilisation is significantly below that of European comparators (Figure 17.2).

Figure 17.2: The GB's train utilisation is at the low end of the sample



Source: Civity.

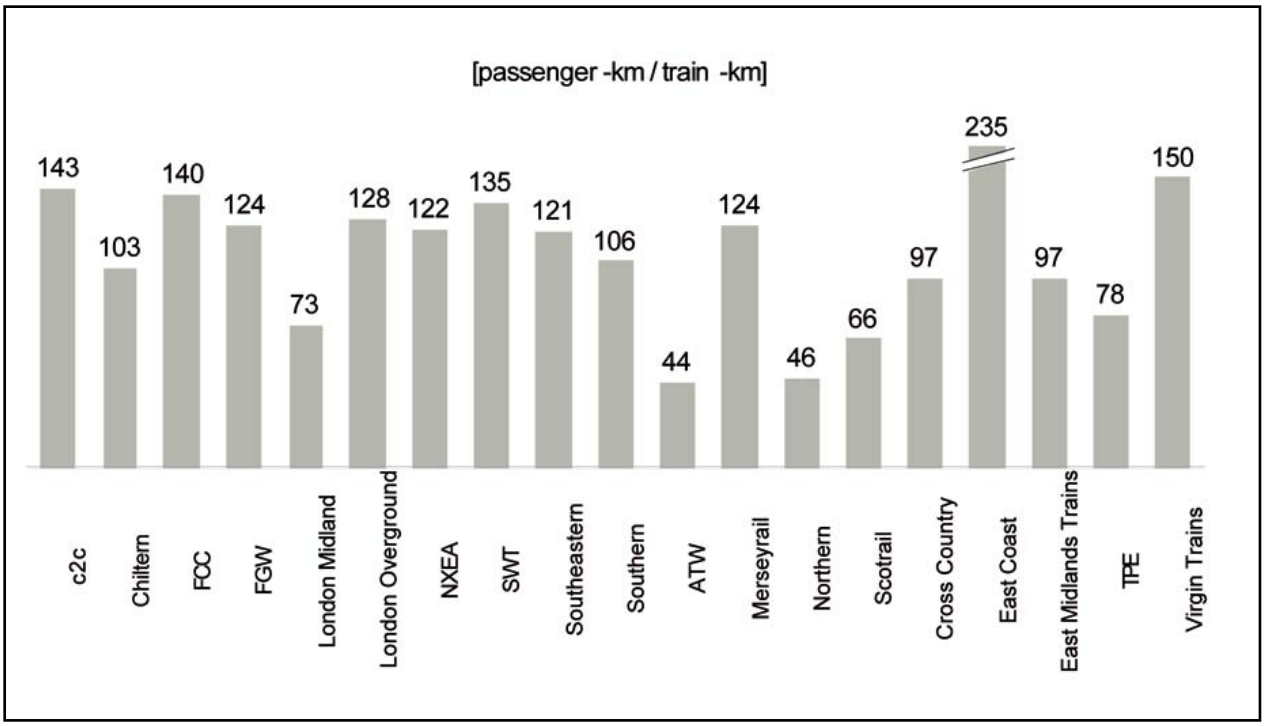
Train utilisation in GB is very different from that in France (where SNCF long-distance trains achieve an extremely high 294 passenger-km per train-km) as a result of the use of generally lower-frequency, longer, fixed-formation double-deck trains, which could not be accommodated in Britain as a consequence of its legacy of short platforms and restricted loading gauge. In other countries there is also a difference in spatial patterns that often enables train operators to cater for two-way peak flows with consequently higher average loadings per train.

There are substantial variations within the GB rail network. This can be partly explained by the nature of train services – the intense use made by London and South East operators in the peak is balanced by relatively low off-peak loadings, due to high frequencies being maintained, while longer-distance operators have the opportunities to practise more advanced yield management

techniques to spread loadings across the day, even though this is somewhat constrained by Government fare regulation.

Where services are radial in nature, for example most London commuter routes, the average load per journey will be significantly lower than the high-peak load closest to the London terminal or major interchange point. This results (even in the South East of England) in service capacity only being tested on very limited distances close to Central London. As a direct consequence, mid- to outer-suburban passenger trains tend to run relatively lightly-loaded for considerable distances before loadings reach anywhere near capacity, depressing average load factors and, compared with some European networks, making train utilisation compare unfavourably (Figure 17.3).

Figure 17.3: East Coast shows the highest average train utilisation



Source: Civity.

In some countries, for example Switzerland, there has been considerable effort to promote the use of the rail network for off-peak leisure travel. This has produced higher loadings throughout the day, but it has also produced problems with managing crowding. The use of shoulder-peak and yield-managed pricing is under consideration in this Study report.

17.5 Where is the GB rail network under pressure?

In the last 20 years, there has been a significant increase in the volume of traffic carried on the network. This has manifested itself in increasing train-km, particularly for passenger traffic. Where capacity exists on existing train services, this growth has generally been accommodated through increasing load factors. However, this is not possible where trains are already full and where the network is operating at, or near, its full theoretical capacity.

Although there has been considerable growth around regional cities, most, but not all, of the system capacity problems are experienced around London. The nature of the rail market in the South East of England, with a large catchment area around London and extremely high demand for commuter travel, has influenced the provision of both infrastructure and train services. Even if there was a financial case for additional expenditure, there is limited potential to extend track or terminal capacity – as land is not readily available. The extremely high capital costs of building new infrastructure in the South East of England (for example in the case of the Crossrail and Thameslink projects) mean that, for the most part, demand has to be accommodated using existing physical infrastructure.

London's high-peak demand is generally serviced by train services formed by the maximum number of vehicles the network can accommodate. Where the signalling system permits, some additional services have been provided, but the availability and economics of providing additional rolling stock for use in the high peak, as well as the additional operating costs and resources required, means that there is unlikely to be a pure financial case for further provision. Outside London, there are clear capacity issues around major urban centres such as Manchester and Leeds. One of the key constraints is the mixed-traffic nature of the rail system. For example, the East Coast Main Line carries long-distance passenger services, London commuter trains, a number of cross-country inter-urban services, freight, and its infrastructure is shared or crossed by a number of other train services. Theoretically, capacity use is only truly maximised where all trains have similar characteristics in terms of speed, performance, station calling patterns, and origin and destination. In practice, the railway has to accommodate a number of markets and, therefore, there is a commensurate reduction in the realisable capacity of the network.

17.6 What parts of the network are under-utilised and why?

As a result of changes in economic geography, the rail system has some areas where usage is relatively low, although in many cases the density of train services has become constrained by physical capacity – for example, long single-track sections limit the number of trains substantially, and signalling systems have often been re-designed to support the lower levels of traffic on offer at that point in time. Commuter and rural passenger services usually experience heavily-peaked demand, which means that off-peak trains are invariably not fully-loaded. The capacity provided is that required to move the volume of peak travellers.

Another cause of under-utilisation is not running trains to their full potential length. In many cases Government specifies, or operators take the view, that frequency is a principal driver of demand and that therefore more frequent, short trains promote higher net revenue than a lower-frequency service. Although this often drives higher revenues for individual Train Operating Companies (TOCs), the systemic effect is higher costs and a loss of system capacity.

The British network is characterised by a large number of through-journey opportunities. Passenger preferences are to minimise the number of interchanges, and therefore some station pairs are connected by a small number of through services. Past practice has tended to promote the development of new through-journey rail markets (which tend to be popular with passengers), often at the expense of optimal network utilisation. The consequential effect is that often these trains are shorter than other long-distance trains on a route, leading to some train paths not being utilised by full-length trains. There may be a case to consider whether better-quality interchanges,

both environmental and in terms of passenger assurance, might be a more effective use of trunk route capacity, rather than the through running of services.

17.7 Where are the key constraints on network capacity?

There are therefore a number of constraints that impact upon the availability of capacity:

- infrastructure – physical characteristics, including speed, signalling and flexibility of train control;
- terminals – the ability of stations to handle throughput of passengers and to handle train movements;
- rolling stock – both in terms of the total quantum of vehicles and their design, configuration and allocation; and
- operational rules – the trade-off between capacity maximisation and achieving acceptable levels of operational performance.

The emphasis on improving performance has been a priority from the late 1990s, accelerating following the impact of gauge corner cracking on the network in 2000. The current Control Period (CP) has a target of a 92.6% Public Performance Measure (PPM) by 2014, which requires specific timetabling interventions and principles. In some routes, for example the Wessex Main Line, a timetable recast in 2004 resulted in vastly improved performance at the expense of running a lower-density service. This deliberate trade-off between capacity and efficiency has led to a significant improvement in customer satisfaction.

Terminal capacity is an increasing problem with higher levels of passenger journeys – especially in London where interchange onto other modes and the design of stations results in an impact on the ability of the network to "process" more passengers. The geography of Great Britain, with the continued divergence in economic performance between the South East and other regions, acts as a further exacerbating factor, with the catchment area for travel-to-work extending significant distances in both physical and time terms. The relative reduction in the costs of commuting (and the distance taper) compared with average earnings produces a significant distortion.

17.8 A whole-system approach to capacity utilisation

In the UK, Network Rail (NR) as the Infrastructure Manager (IM) is required to provide access to the network on a non-discriminatory basis, and should operators wish to bid for available capacity then the IM must facilitate this. For this to deliver allocative efficiency, the structure of costs and charges needs to be optimised. Both operators and the IM need, therefore, to have a good knowledge of both their own costs and prices as well as those of their TOC colleagues in order to devise solutions that deliver optimal outcomes.

At present, neither party has this knowledge. Both TOCs and NR are less than transparent in terms of their costs or revenue structures, and this makes "whole-system" analysis almost impossible.

Current track access charges are multi-part, built up of a number of components, of which the following are the most significant:

- fixed-track access charge – an allocated charge paid only by franchised train operators;
- variable-track access charges – calculated per vehicle mile and type;
- capacity charge – calculated per train mile, and spread across an entire train service, irrespective of the congestion on the network for individual trains; and
- electricity used – calculated per traction unit mile and type.

Train operators tend to be focused on revenue generation within their own franchise limitations, even if this is at the expense of the efficiency of the overall train plan. This can lead to them running shorter trains than might be optimal in "whole-system" terms and, as a result, they tend to be less concerned regarding network congestion. Given the tight specification of both timetables and specified traction equipment in current franchise agreements, the operation of "no net loss, no net gain" provisions within franchises means that operators' exposure to infrastructure capacity issues is limited. Conversely, the IM is unlikely to be fully remunerated for enhancements required to be delivered to increase the capability of the network.

As a result, the IM has a tendency to promote large capital-intensive construction solutions to capacity issues, when other solutions may be more efficient. Neither party has the understanding or incentive to approach system capacity issues "in the round". Similarly, nobody within the industry is focused on the productivity of the overall system approach to "total ridership". The result is sub-optimal and is illustrated in the below-average train utilisation performance on the GB rail system compared with European peers.

17.9 Opportunities for improving value for money

Britain's rail network, although different in many respects from European comparators, nevertheless demonstrates that there are a number of issues that could be addressed to improve the utilisation of the system.

These include:

- the use of improved price and yield management to encourage passengers to change travel patterns to spread peak load factors;
- longer-term integration with land-use planning to optimise the demand for travel and the development of policy interventions to ensure that appropriate price signals are sent to the market;
- reviewing the structure of track access charges to ensure that the full marginal cost of train movements is paid by operators;
- changing the industry's mindset regarding the utilisation of existing system "total ridership" capacity before commissioning expensive capacity enhancement schemes that only serve to increase unit costs;
- nominating an individual or body whose sole responsibility would be improving train and network utilisation that could reduce significantly the need for marginal capacity improvement

projects – the industry has an obligation to make better use of the capacity it already has before creating more;

- examining whether segregation of service types, or homogenisation of train speeds, would provide operating, economic and social benefits; and
- the greater use of older rolling stock during peak periods – many European railways manage their fleets so that there is a peak-hour resource of lower-quality, older rolling stock, which is used to provide additional capacity in high peaks. This reduces the capital requirements for new-builds while concentrating higher-quality stock in all-day service. Given the low mileage travelled by these fleets, they can be maintained cost-effectively for some time beyond the lifespan of stock that is in use intensively.

Improving the use of capacity is probably not an issue that can be, or needs to be, addressed in isolation. However, it does represent a major opportunity.

As mentioned above, **if the industry can change its mindset regarding the utilisation of existing system capacity in the coming years and, in particular, focus on improving average loadings of existing, more lightly loaded services, there is an opportunity (with projected passenger growth and a slowly reducing cost base) to significantly improve unit costs in the industry.** In other words, if future growth can be accommodated on a largely static cost base, as indicated by GB rail's performance against other European railways, unit costs can be driven down by some 15–20%.

The consequential impact of changes to industry structures, particularly with respect to incentives, train service specification and funding can deliver conditions where capacity utilisation and thus value for money can be optimised too.

18. Other operational issues

18.1 Introduction

This section aims to summarise and comment upon a number of value for money issues that relate to railway operations that the Study felt were relevant, but which did not feature or were not consolidated in other sections of the report. As such they cover such diverse areas as control centre management, operations staffing, passenger information and possessions management.

Operational matters are largely divided between Network Rail (NR) (which retains professional primacy for system operations) below the rail, and the passenger train and freight operating companies who undertake most of the operational activity on a daily basis above the rail.

Overall the operations costs on the UK rail system are seen to be among the highest in Europe, with an outdated operations infrastructure, inefficient working practices and poor use of available network capacity. GB rail costs for network operations were benchmarked as the second highest in a comparative exercise with European peers in 2009. NR's operation staff per track-km was also seen to be comparatively high and this largely seems to be driven by the relatively slow progress in control and traffic centre consolidation in this country and the large number of manned signal boxes and traffic control points that remain on the GB network (see the control and traffic management section for more detail (Section 18.4)).

18.2 Possessions management and the seven-day railway

In interviews with industry stakeholders, it became clear that there exists a great deal of frustration in the way in which network availability is currently dealt with and, in particular, with the inefficient and disruptive manner in which railway engineering possessions are planned and managed. The question of network capacity management in general is dealt with in Section 17 of this report. In terms of engineering possession management – a key element of operations strategy – the current arrangements were seen by stakeholders as:

- inefficient, costly and risk-averse;
- good business for bus owners, not for rail operators;
- incentivised to shut the railway, rather than keep it open for normal business;
- anachronistic, in that journey patterns/society has changed, but railway engineers' activities and planners' thinking have not – Sundays and weekends are no longer the quiet periods of the week when people stay at home, they are now periods of major recreational activity;
- significantly worse in their execution than past arrangements (even pre-privatisation) when trains ran with less disruption when engineering works did happen; and
- a product of declining operational management skills and competencies that are becoming increasingly engineering led (the phase used by one stakeholder was that "more thinking was going into the pouring of concrete than running trains").

The end result is that network availability at certain times of the week and year has declined and engineering works/track possessions have become, by default, complete line blockages, rather than the managed running of trains.

What is clear is that track possessions have become a very costly business, not only in terms of the direct cost of labour and materials for the work itself, but also in terms of the cost of replacement transport, revenue foregone (much of which is difficult to estimate), brand damage to "GB Rail plc" as well as individual operators, and finally Train Operating Company (TOC) and Freight Operating Company (FOC) compensation payments. The only real beneficiaries are private bus operators.

This issue has been recognised by NR, TOCs and FOCs, and the concept of what is known as the seven-day railway has been developed to minimise the effect of engineering works on the system and to increase system availability – particularly on high-yield, strategic, long-distance routes across the country. This is particularly relevant to routes where demand is growing strongly on Sundays and weekends, and where works can be planned and carried out around the needs of a seven-day railway. In these places, works are better carried out at times of low demand, for example weekday nights, with greater automation and a modified workplace environment.

Although the unit cost of night work and the infrastructure needed might be more costly, it is very easy to calculate whether this is outweighed by a reduction in compensation payments, substitute transport costs, and more critically increased revenue and market share. Put simply, it is not difficult for the players on any particular route to make a business case to modify their approach. However, this is not the answer in all cases and, on routes of low train frequency, low fare structures and light patronage, this is unlikely to lead to a business case for radically different possessions management. One size will again not fit all. Nonetheless, possession strategies and practices can be improved.

A "whole-system/whole-industry" approach to engineering possessions management would lead to greater overall value for money for the industry, grow patronage, improve customer satisfaction and reduce taxpayer subsidy. However, incentives at present do not engender a whole-system approach. Section 9.1 of this report also covers this topic from a different perspective and estimates the value that might be captured from this approach.

Other European countries have different approaches to the same issue:

- In many countries infrastructure (particularly signalling) has been designed to facilitate works taking place during times of reduced train operation. This structural design approach at times of asset renewal pays dividends during the whole-life of an asset. However, even in Great Britain, where, for instance, bi-directional signalling has been provided to enable blocked lines to be avoided by using parallel tracks, such facilities are rarely used.
- Risk is managed by proportionate management action rather than by cancelling trains and shutting routes. For instance, work sites close to running lines are protected by speed restrictions, modified hand signalling, single-line working (bi-directional management of trains manually over a single parallel line) or, as used to happen in Great Britain, trains are stopped and cautioned to protect the works.
- "White Periods" are timetabled into the train plan to enable engineers' access to the track during the middle of weekdays, for example, in France on the TGV routes out of Paris, where services are timetabled to create track access periods for their engineers as a standard practice. Although this is not an optimal solution, it is often a value for money alternative – particularly where, at present, high frequency services render work impossible on four-track sections of line

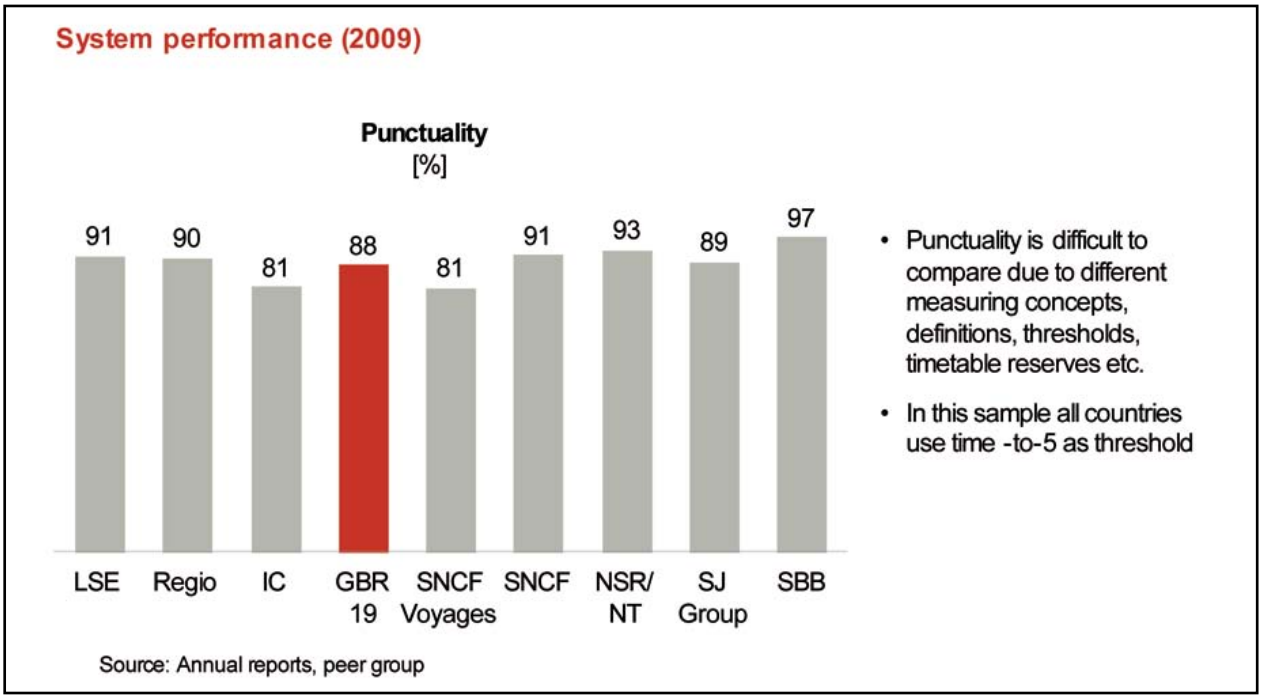
during the day, despite the services running being largely empty. A modified timetable during the middle of weekdays could allow White Periods with little negative effect upon passenger amenity on some routes in Great Britain.

- In some countries, system design allows for discrete diversionary routes that allow line closures for engineering works that minimise disruption. Sadly, such design has been either overlooked in Great Britain or removed under short-sighted rationalisation schemes. Freight operators, who would be the most affected by weekday night possessions, have stated their willingness to use alternative routes provided they are fit for purpose.
- It is also important that the seven-day railway is seen in the context of not just the passenger railway, but also the freight railway. Rail freight operators need seven day, 24-hour access to the network as well – particularly in relation to their role as a key part of the national and international logistics chain, and their need to deliver on-time product. The maintenance of diversionary routes for key rail freight flows goes some way towards off-setting this issue, but track access is just as critical, particularly during weekday nights, to freight as passenger.

18.3 Performance management and the National Task Force

There have been major strides in performance management in the UK in recent years. Civity's comparison of system performance for 2009 (see Figure 18.1) showed the performance of the Great Britain system as little more than average, but punctuality is difficult to compare system-to-system due to different measurements, definitions and thresholds. And what is evident is that performance has improved again markedly since 2009. Again, what is also undisputed is that, since 2001, when system performance was at an all-time low following the Hatfield derailment, there has been a significant improvement.

Figure 18.1: GB rail operational performance shown against European peers (2009)



Source: Civity.

In addition, it has to be acknowledged that train performance is one area where the industry itself has "stepped up to the plate" and, through joint action on the part of all industry players, has delivered a "whole-industry/whole-system" programme of action.

The question might be asked as to how the industry has achieved this and why? Also, what lessons can be learnt that might apply to the many other cross-industry/whole-system issues that confront the industry? For instance, what can be learned about industry leadership and decision-making (see Section 6 from this achievement).

In essence, the system performance challenge since 2001 has been successfully addressed:

- as a result of clear direction and leadership by successive Secretaries of State and Ministers of State who tasked the industry to sort out its problems on performance and held the industry clearly accountable for delivery and methodology, yet with minimal interference;
- by the creation of a cross-industry National Task Force (NTF) to tackle the performance challenge – NTF has a small secretariat, is chaired by the industry, and has a membership from all stakeholders (train operators owning groups, FOCs, the Department for Transport (DfT), the Office of Rail Regulation (ORR), Rolling Stock Companies (ROSCOs), the Railway Safety and Standards Board (RSSB) and NR) and has co-ordinated industry response to system performance shortcomings as well as tasking itself to achieve results;
- by the harnessing of a natural desire by the railway community to "run a good service" – as a result best-practice has been shared and peer-group pressure applied selectively to create a "can do/must do" approach;
- by the development of "bottom-up" performance plans and targets called Joint Performance Improvement Plans (JPIPs) on a route-by-route basis, aggregated nationally – JPIPs are agreed between TOCs and NR, published by the NTF and backed up by strategic and tactical plans. The Secretary of State holds the industry, TOC by TOC, NR route by route, accountable for the delivery of these targets;
- by the adoption of increased allowances within the train plan for "recovery time" (which reduces performance risk, but absorbs capacity inefficiently); and
- because in nearly all cases the incentives for success in this area are aligned – this tends to create a "coalition of the willing".

In terms of industry management, much can be learnt from this experience. Industry players can work together for the common good if the structure and incentives are in place to do so and, most importantly, if Government is prepared to set a clear strategic objective, without getting involved in the detail of delivery.

There is strong evidence to suggest that the historic high levels of customer satisfaction (see the ORR's published Monitors) achieved throughout 2010 have been largely driven by the equally historic high levels of punctuality and system performance attained concurrently. Indeed, it seems clear that train performance is the largest single driver of customer satisfaction. All other factors are secondary to train service punctuality and reliability, even the cost of travel.

Government needs to be aware of the cost/value for money implication of making these types of requirements on TOCs in particular – with marginal benefit set against often high capital or recurrent cost. Government must be aware of the consequences of committing additional resources to solve problems where marginal benefit will accrue.

18.4 Control and traffic management

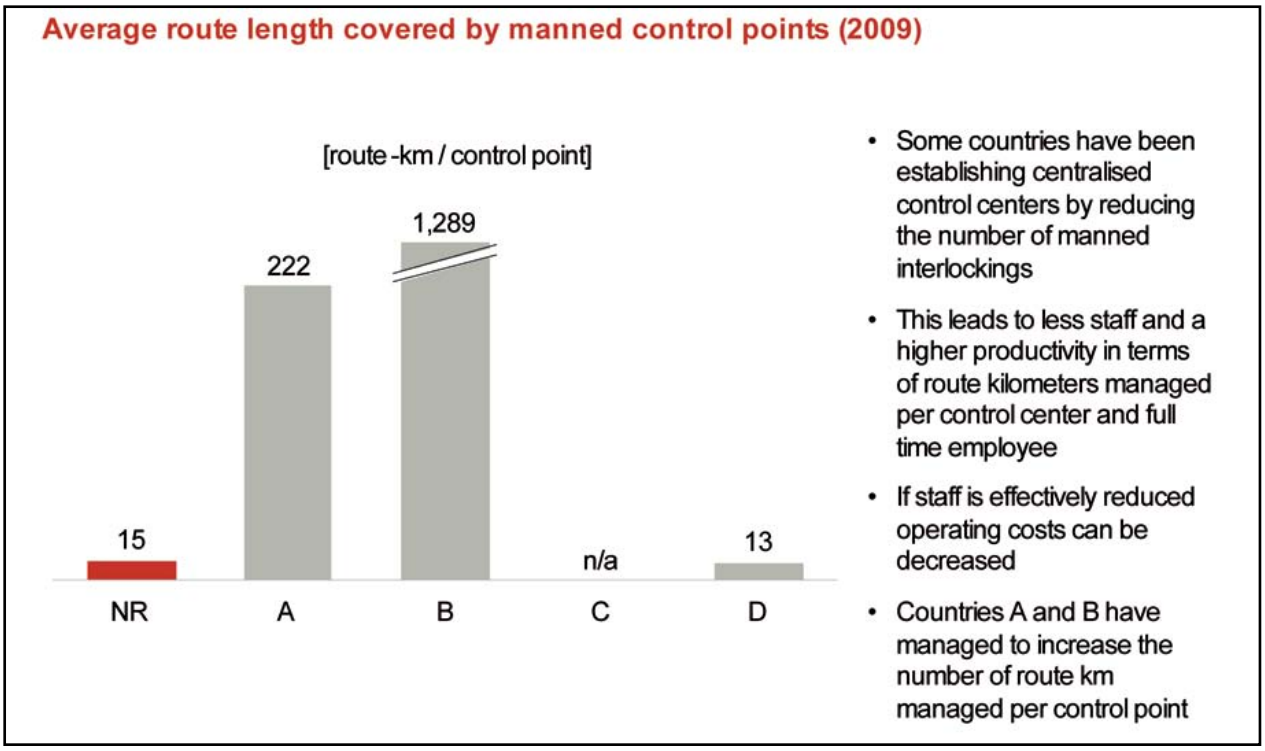
The rail system is controlled and co-ordinated on a real-time basis, line-by-line, route-by-route, by a series of TOC and NR control centres spread across the network, where the train service is monitored and tactical decisions made in order to optimise train operation and performance. These control centres are now largely co-located and route based.

However, operational tasks are carried out in a number of different organisations, each with different goals and tasks are often duplicated. There is little in the way of a "whole-system approach" to operational strategy and delivery, largely as a result of TOCs failing to engage fully with NR as the industry lead and vice versa. The question must be asked as to whether the operations management lead should come from a different body in the future, with better "whole-industry" accountabilities.

In future, operational strategy has to be formulated on a whole-industry basis, with far greater integration of TOC/NR activities. The alignment of operational activities between TOCs and NR is as important as that of infrastructure management activities, and is largely dealt with in detail in Section 7 of this report.

Comparative benchmarking commissioned for this Study indicates that NR has a high ratio of staff per track-km compared with its European peers, and that other countries have found that the cost of traffic management is usually driven by the nature and relative efficiency of traffic control activities (Figure 18.2).

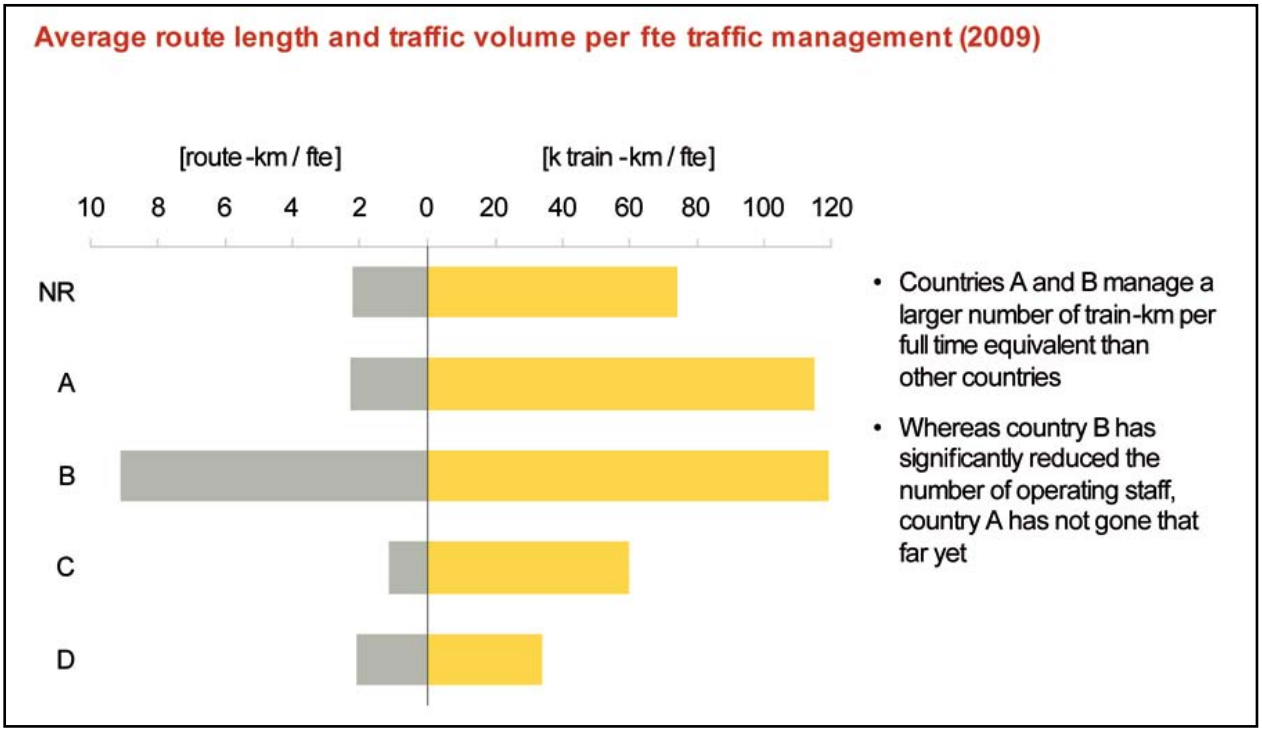
Figure 18.2: Countries A and B have completely eliminated manned signal boxes and established centralised control centres



Source: Civity.

Other countries have established widespread centralised control and traffic management centres across their networks by reducing the number of technically obsolete, locally based, legacy signalling systems and control points, which inevitably leads to fewer staff and higher productivity in terms of route km managed per control centre/employee. In some countries this has led to major efficiency savings (Figure 18.3). In the UK this process has still a long way to go as NR has a multitude of manual interlockings and locally-controlled signalling. Consolidation is limited.

Figure 18.3: Country B has benefited rigorously from centralisation and automation

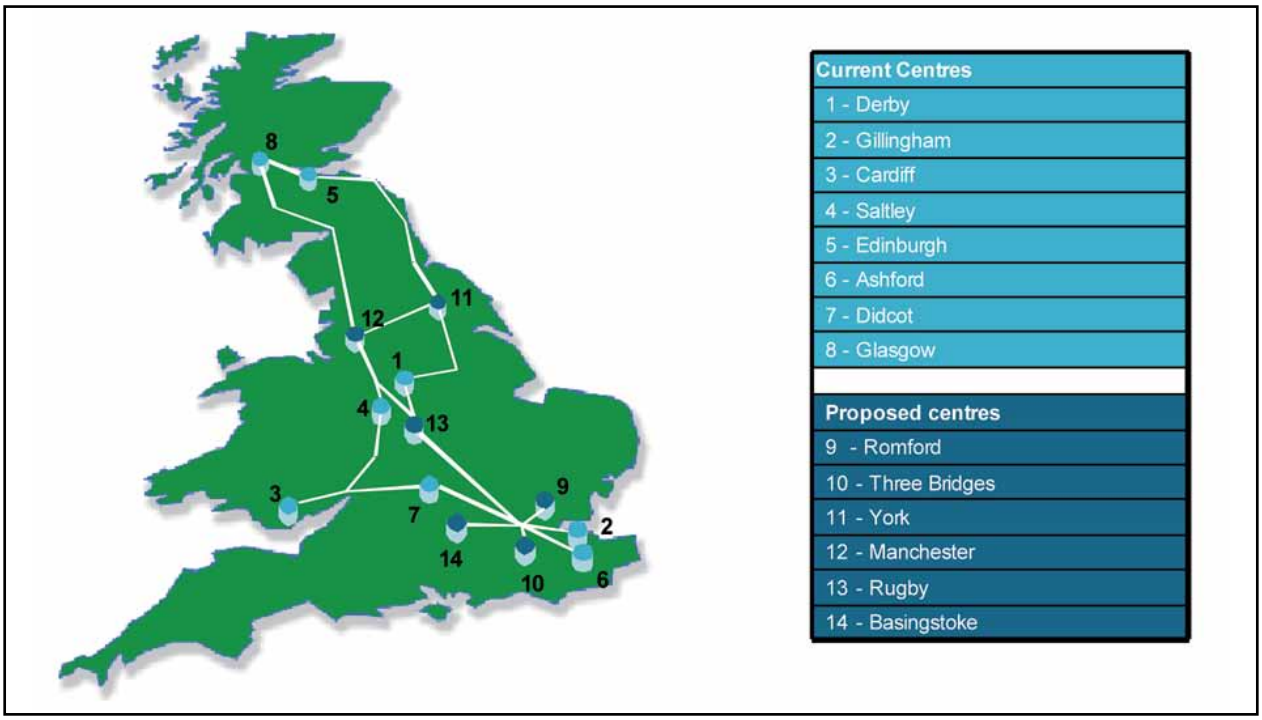


Source: Civity.

The combination of route-based control and traffic management centralisation and consolidation in operations, and efficiency improvements in staffing, can unlock substantial cost reductions, as 90% of the cost of network operations is typically driven by staff costs.

NR has recently commenced the development of a national operations strategy which, in particular, addresses train control and signalling consolidation. This strategy concludes that there should be fewer control centres (circa 15 nationally) across the network, that traffic management (signalling) control should be consolidated and integrated within these centres, and that all elements of operational control and passenger information should be included (Figure 18.4).

Figure 18.4: NR's existing and proposed control centres



Source: NR.

The Study endorses this strategy, which has to be a priority initiative for NR over the next five to ten years. NR should seek funding in order to deliver this project as expeditiously as possible, while trading off capital expenditure, premature signalling renewals and operational expenditure benefit.

NR has proposed that the construction of additional centres should be accelerated and existing TOC and NR control centres be relocated and integrated (not just co-located which is a significantly sub-optimal solution) as soon as possible, with the integration of traffic control (signalling operations) following as soon as accelerated re-signalling and remote monitoring can be activated. This approach is seen as an important value for money initiative as:

- it will lead to immediate labour productivity and efficiency savings, both in respect of control and traffic management functions;
- it will allow much more effective and simpler control of rail operations, with tangible train performance improvements; and
- it will significantly improve the co-ordination, management and dissemination of passenger and staff information on the network, especially during times of disruption.

However, as alluded to above, the full potential can be unlocked only by a number of additional measures that are aimed at improving staff efficiency, such as:

- the rapid development and installation of a state-of-the-art IT-based traffic planning and decision support system to support signallers and controllers;
- a reduction in operational incidents and perturbations, which create additional workload;
- the application of more objective, targeted deployment of multitasked operational staff;
- an increase in productive working time by staff flexibility, multitasking, part-time working, management and optimisation of shift working and the optimisation of working hours; and

- a reduction in the hourly cost of operations labour by increasing net working hours.

These and other issues are also covered in Section 12 of this report.

18.5 Information systems and the customer

Section 16 of this report deals with industry IT and information systems in much more detail and makes recommendations on how they might be improved for the benefit of the whole industry. However, with regard to control and traffic management, it is clear that information systems need to be:

- provided on a "whole-industry", more integrated basis in order to optimise information delivery to customers and staff;
- designed to fit with a new route-based integrated control centre infrastructure model;
- brought closer to traffic management/signalling activities where primary information is usually collected and collated before dissemination; and
- designed for the benefit of customers, as well as rail staff.

The delivery of relevant and meaningful information to the customer, especially during times of disruption, is probably one of the weakest elements of today's railway. Effective passenger information is a major driver of perception on value for money to the customer and the public at large. It drives repeat usage and directly affects revenue. Good customer information is good business, but the industry seems to be struggling to address this area.

The NTF, mentioned above, has recently been challenged by Government to address this issue – much as it was tasked to do with train service performance. However, unlike train service performance, parties represented at NTF are not as incentivised or, in some cases, as motivated to "fix" the problem. TOCs and FOCs face the customer directly, and take the revenue risk of delivering a sub-optimal service to customers. Information systems, processes, staff and information dissemination are spread across several parties, and the primary providers and co-ordinators of service information are not directly employed by the TOCs and FOCs, and are not so exposed to the consequences.

In essence, effective dissemination and delivery of information will only happen when there is a more effective integration of NR and TOC activities and organisations at route-level, and a more integrated control structure in place. Until that point too many people will be too distant from accountability to the customer and their business. However, allied to this, is the need for a more technologically advanced information infrastructure and the application of more carefully considered information strategies, aimed as much at reassuring people while they travel, as to providing what is too often irrelevant, untimely or inaccurate information.

London Underground Limited (LUL) has begun to move its strategy to this model and it is very effective. Under the new model, most hard-fact train running information is automated, but it is reinforced by frequent human intervention, with constant real-time system updates at key points of the journey. The aim is one of constant reassurance.

The mainline railway would do well to learn from this approach, coupled with targeted investment in more automated information systems and targeted staff training, coaching and performance management. This model also depends on staff training and empowerment.

18.6 Summary

In addition to the recommendations elsewhere in this report that address many of the detailed operational cost/value for money issues that GB rail finds itself faced with at present, there are a number of further initiatives highlighted in this section that are worth considering:

- Significant further improvement is possible in the management, planning and execution of engineering possessions on the GB rail system. As such the industry has to develop a more co-ordinated "whole-systems" approach to possessions management and strategy to drive better value for money. Other structural and incentives recommendations in this report go a long way towards assisting this, but the industry must continue its development work on the 7-Day Railway project as a priority in order to:
  - attempt to run a greater percentage of the timetable by minimising whole line blockages and making better use of bi-directional working and work site protection that allow trains to continue running during engineering works as well as maintaining credible, low-cost diversionary routes;
  - optimise engineering access to the track if necessary by planning "White Periods" for engineering access where this is sensible; and
  - minimise substitute transport arrangements and when they are necessary or unavoidable managing them in a much more professional manner.
- The industry has to build upon the success of the NTF governance model in tackling other cross-industry issues.
- The industry and Government need to consider at what point further significant investment in optimising train service performance ceases to represent good value for money (as opposed to more limited route-by-route improvement schemes or initiatives).
- In order to provide impetus to labour productivity and efficiency savings in rail operations, as well as improving the management of rail services and improving passenger information, priority must be given to NR's National Operations Strategy which, in particular, addresses train control and signalling consolidation. Funds should be provided that allow the acceleration of this project.
- The industry urgently needs to address the ongoing problem of poor passenger information, especially during periods of service disruption. As such, it needs to adopt an integrated whole-industry approach, invest in appropriate information systems (see further discussion on this topic in the section on information systems (Section 16)), and reconsider its strategy on what the passenger should be told and when.

19. The lower-cost regional railway

19.1 Introduction

In this section of the report the Study considers options available for reducing the costs of the regional railway to minimise the call on the taxpayer.

The Study held discussions with industry leaders to identify solutions to the cost of the regional railway, ran a small cross-industry workshop to identify the key issues, drew on previous benchmarking and also on several Study submissions that provided ideas on how to develop lower-cost railways. The Study has also reviewed the Department for Transport's (DfT) *Rail Technical Strategy*[99] and Arthur D. Little's work for Area G,[100] both of which looked at the options for a differentiated or lower-cost railway.

The Study has focused on the efficiency of the regional railway. It has not considered any options around route closure or significant service withdrawal.

19.1.1 Context

The Study, in its Interim Report, highlighted the difference in the net cost to Government and passengers of the three categories of franchise:

- long distance;
- London and South East (LSE); and
- regional (see Table 19.1).

Table 19.1: Difference in the net cost to Government and passengers of the three categories of franchise

	Passenger miles (bn)	Net cost to Government (£m)	Net cost pence per passenger mile	Net cost to Government as % of total cost
Long-distance franchises	9.4	693	7.3	25
London and South East franchises	15.7	760	4.8	19
Regional franchises	6.0	1,873	31.1	61

99 Department for Transport (2007) *Rail Technical Strategy*. London: DfT.
100 Little, A. D. (2010) *Achieving Value for Money in Safety, Standards and Innovation*.

As the Study acknowledges in its Interim Submission, there are different ways of allocating Network Rail (NR) costs, and these can give different figures, but the overall conclusion seems inescapable – that compared with long-distance and LSE franchises the regional franchises convey lower passenger volumes, have lower fares and low overall revenues in proportion to their cost base. Consequently, these franchises have the highest subsidy per passenger mile.

The regional franchises, though, have very different characteristics within each operation. The regional urban network, such as that in Leeds, Sheffield, Liverpool and Manchester, is used by commuters and leisure travellers accessing major conurbations and is characterised by relatively high volumes of traffic in peak periods. The inter-urban regional network connects major conurbations on routes not served by the long-distance franchises.

In contrast, the regional non-urban network is focused on providing largely societal benefits. Very little of this network is electrified and is mainly controlled by traditional manual signalling. The majority of rolling stock is over 20 years old and in some cases derived from bus technology. Most stations are unstaffed, but trains will have a driver and a guard.

Much of this network operates away from the major conurbations and is focused on rural counties such as Lincolnshire, Devon, Cornwall and Cumbria. The rural railways of Scotland and Wales fall into this category.

While the following issues could apply to the urban, inter-urban and non-urban networks, this section of the report concentrates primarily on non-urban routes.

19.2 Changing the concept of the regional railway

The GB rail system has a "go anywhere" philosophy, where most trains can access most routes. While there are some limitations driven by electrification and the height and width of certain trains, the system is operated to provide flexibility. On a day-to-day basis this has enabled through journey opportunities, while for planning purposes this flexibility has allowed rolling stock to be redeployed in response to demand.

Reducing the cost of the regional railway would require a trade-off between flexibility and the ability to provide bespoke low-cost solutions that involve a different approach to the operation, maintenance and renewal of the railway.

Such an approach would require a realistic assessment of the needs of the regional railway and a review of the characteristics of the railway that cause cost.

19.3 The technical characteristics of the regional railway

The key to achieving a lower-cost regional railway is to reduce the cost of its constituent elements, particularly those relating to rolling stock and infrastructure. These could include:

- standards applying to the regional railway;
- specification of rolling stock;

- nature of signalling and train control; and
- infrastructure requirements;

19.3.1 Standards

A change in standards would be a pre-requisite to cost reduction. There would need to be a new set of over-arching standards for lower-cost regional routes, covering:

- operational practice;
- safety;
- engineering; and
- interface requirements with the mainline railway.

They would need to be based on the requirements of the lower-cost railway rather than an evolution of existing mainline standards, and would need to be differentiated to take advantage of the lower risk profile that results from a low-speed, lightweight, low-frequency railway.

A specific example is the suite of standards applying to the construction of new stations (see Box 19.1).

Box 19.1: Standards applying to station construction

The main standards that apply to stations relate to platform widths, platform heights, signal sighting, stop board positions, stopping tolerances, fire safety (secondary means of escape) and tactile paving. While these standards may be relevant to main line stations with high footfall, this is less the case on the regional railway. An opportunity to access a new retail or housing development might change the economics of a route, but it is likely to be ignored if the cost of platform construction is inflated by inappropriate standards.

The example of the speed and cost of the construction of the temporary platform at Workington North following the Cumbria floods is a reminder of what could be achieved on a lower-cost railway.

19.3.2 Specification of rolling stock

The options for the provision of lower-cost trains could include a number of solutions:

- in exceptional circumstances new vehicles could be procured, but they will need to be significantly cheaper than current heavy rail vehicles to be justified – for example, the average rail vehicle cost is currently above £1m compared with an average cost of a road coach of around £150k;
- there may be opportunities in some areas to convert from heavy rail to trams, or tram-trains, although the economics of the latter have yet to be fully proven;
- cascading trains from other parts of the network or other rail undertakings – second-hand foreign trains or trams, which are widely deployed in mainland Europe, may prove suitable for routes that do not have loading gauge constraints; and
- refurbishment and life-extension of existing stock, but taking the opportunity to reduce greatly the operational costs and weight of the vehicle.

Reducing the weight of rail vehicles slows down the rate of infrastructure wear and tear, reduces infrastructure costs and lowers fuel costs. Lower weight vehicles could be designed and constructed through rigorously minimising vehicle specifications so that they meet the requirements of a new lower-cost service. Weight could also be reduced by:

- reducing traction power, which allows a lighter construction for body and chassis;
- removing air-conditioning and powered doors;
- introducing lower crashworthiness characteristics that align with low-speed operation; and
- reducing bogie weight by using single axles with active suspension and steering capability in order to minimise track damage.

19.3.3 Nature of signalling and train control

The cost of signalling assets could be significantly cut by reducing or eliminating the need for lineside signalling equipment. Initiatives to enable this removal include:

- operating on "drive on sight" principles as used in tram operations where the driver responds to the visual presence of vehicles and obstructions ahead – essentially this is the method of driving employed in a road vehicle, and with modern technology and low speeds can be regarded as a low-risk method of operation;
- equipping trains with improved braking to enable quicker stops – one application, found on trams, is the track brake, whereby braking is enabled by direct interaction between the vehicle and the track rather than via the wheel – this facilitates "drive on sight" operation; and
- moving to a dispatch-based signalling control where instructions to proceed are given to the driver over mobile phone or the GSM-R network. This would greatly reduce, but not eliminate, the need for lineside equipment. It would also enable control to be centrally located and would remove the need for manned signal boxes, which control only a small geographical area.

19.3.4 Infrastructure requirements

The most significant infrastructure costs are track and civil engineering structures such as bridges, embankments and cuttings.

Cost reductions in civil engineering assets could be achieved by tailoring the maintenance regime to reflect actual loadings, rather than to theoretical published capability. This reduces inspection frequencies, the volume of maintenance work and significantly defers the renewal of the assets. The load imposed on a structure is affected by the absolute weight of a train and the weight transmitted through each axle, which, in turn, can be affected by the speed of the train. Structure life could be extended by adjusting the speed of the train over a structure as well as its weight.

Track infrastructure costs could also be reduced through the operation of either lighter, more track-friendly vehicles or vehicles with track-friendly suspensions, thus reducing the rate of wear and tear, and allowing greater intervals between inspection and routine maintenance tasks. The need for capital intensive renewals will be removed, as the lower route tonnages would enable a move to perpetual maintenance and life extension. This approach has been adopted by the North American railroads on low-density freight lines.

Other opportunities for lower cost infrastructure include:

- re-use and cascade of materials and equipment from main lines;

- simplify track layouts to remove redundant infrastructure; and
- remove the need for comprehensive maintenance of fence and boundary lines – it is noteworthy that low-speed, low-frequency routes in mainland Europe are not fenced.

19.4 The operating characteristics of the regional railway

Besides its technical characteristics, the manner in which the lower-cost regional railway is planned, operated and timetabled would affect the costs it creates and the revenues that it earns. This requires a fundamental review of:

- working methods and operating practices;
- locally focused service levels; and
- flexibility on fares.

19.4.1 Working methods and operating practices

A regionally based operation, with greater local autonomy, could be free to set staff competency and training standards that reflect the specific risks and knowledge requirements of the local operation. National standards are not always appropriate.

The use of a multi-skilled workforce covering commercial, operational and engineering needs, with salaries set by local benchmarks, would ensure that employment costs better reflected the economic circumstances of the regional railway. Part-time working would encourage a greater involvement from the local community, promote a diverse employment base and facilitate seasonal employment where this would be relevant.

Infrastructure and rolling stock maintenance could be locally resourced or contracted out to suppliers that have the necessary heavy plant and specialist skills. There is no particular need for these maintenance suppliers to be rail industry specialists. Suppliers would also be able to introduce mechanisation (as commonly used in North America and Australia) to improve productivity for repetitive maintenance tasks that are typical on low tonnage routes with such tasks being undertaken during daylight hours between trains.

19.4.2 Locally-focused service levels

The service pattern on the regional railway is driven by a number of factors: optimising resources, providing connections with main-line services and working within capacity constraints on the network.

Timetabling driven by local needs could offer more flexibility with services better reflecting the peaks and troughs of patronage. There would be an opportunity for much closer integration with the existing regional public transport network. Train services should be integrated with the provision of other public transport, including common timetables that link at key interchanges.

Although the regional train service would be linked to the core GB network, thereby providing an important feeder service, the focus of the timetable would be on local, rather than national, connections.

19.4.3 Flexibility on fares

A regional operator should also have greater flexibility than is currently allowed by franchise obligations to determine appropriate retail outlets. Ticket sales at local shops or pre-paid authority to travel may be more cost-effective than on-train revenue collection or ticket offices.

The obligation to provide nationally interoperable fares could be removed, as would any requirement to participate in national revenue sharing schemes. While there should be flexibility on fares, which would be set by reference to the market's willingness to pay and competing transport modes, there would also need to be a recognition that the current fare levels and revenue generation contribute to the poor economics of regional franchises. External parties may choose to contribute funding to a regional operator, but users must expect to contribute a greater proportion of costs than is currently the case.

19.5 Learning from experience

The lower-cost railway is not a new concept and there are examples of low-cost operations in the UK and overseas that could be used as a model for applying to the regional railway.

19.5.1 Great Britain

While provision of the lower-cost regional railway may emerge from an evolution of existing practice, there are also options for a complete transformation of a route to a light-rail or tram-train operation. These solutions will involve initial capital expenditure, but have the potential to provide a significant whole-system cost reduction.

Light-rail examples, including the Docklands Light Railway or the Manchester and Sheffield tram networks, operate primarily in the urban environment. Existing or redundant railway routes have been converted to light-rail operation using low-speed, lightweight vehicles operated with minimal staffing. While the operating characteristics, involving frequent stops, may be different from the rural environment, there may be transferable technologies.

Tram-train operations are being actively considered by Passenger Transport Executives (PTEs) and the Department for Transport (DfT). These are seen as having a number of benefits:

- the ability to work on a mixed railway, providing a solution where freight or other passenger services still operate or where total segregation is not possible;
- low-energy demand and infrastructure maintenance and inspection costs;
- simple signalling and level-crossing controls, with extra stations added at minimal cost;
- the possibility of dual power, removing the need for full electrification; and
- the ability to divert to serve areas of demand, especially town and city centres.

19.5.2 Other countries

Low-cost railways operate in Europe, North America and Australia, and the Study was briefed by senior industry managers on how other administrations achieve lower-cost railways:

- in Germany the Kassel network has developed low-cost signalling and train control solutions and a mature system for managing regional networks, with local management given accountability to align operation, expenditure and performance;

- in Switzerland and the Netherlands the cascade and re-use of materials such as point motors, rails, sleepers and miscellaneous components (e.g. base plates and fish plates) from busier lines to regional ones has lowered costs; and
- the primarily freight-orientated "short line" railroads in North America have demonstrated that "localism" can reduce costs. Many short lines emerged after the deregulation of rail in the USA in the early 1980s, when the larger companies could not justify serving single locations. Local operators took over standalone routes and operated them at very low costs, connecting with the main networks to permit the through transit of freight wagons.

19.6 Additional issues for implementation

If, after further study, it was decided to proceed with developing the lower-cost regional railway, there are a number of additional issues to be taken into account.

19.6.1 Determining the scope of opportunity

The initial focus of the Study has been on those routes that have only regional services, but the Study recognises that the principle could be extended to routes that are suburban only. In the section on freight, the Study has also commented that there will be routes on which there is no expectation of freight operation in the future or where freight could amend its operating characteristics to reduce the cost it imposes on the network.

19.6.2 Increasing local engagement

The advantages of greater local engagement in the regional railway are:

- better able to match demand and integrate with the local public transport network;
- more local market focus to target greater passenger numbers while reducing costs;
- stronger political and local enthusiasm for maintaining services that have been locally procured rather than the future being determined centrally and remotely; and
- greater encouragement of innovation in the type and nature of services to be provided.

19.6.3 Determining the best model for franchising the lower-cost railway

While the lower-cost regional railway could be franchised on a conventional basis, there are alternatives which include:

- a gross-cost contract, where the franchisee is reimbursed on a "cost-plus" basis, although there would need to be safeguards in place to ensure that the service provided was delivering value for money;
- an input-based franchise with the franchise based on the highest level of service that is bid against a fixed price, thus incentivising innovation; or
- a vertically-integrated franchise or concession.

19.7 Potential for cost reduction

The Study acknowledges that moves towards a lower-cost railway will not provide instant or significant savings. It would only be applicable to a small proportion of the network and much of the gain comes from avoiding infrequent renewals and other occasional, but significant, items of expenditure. Some of the solutions identified by the Study would involve capital expenditure, although others would only require a change of attitude to the procurement and provision of local services.

19.8 Recommendations

The Study recommends that the principles outlined in the report should be further developed and piloted in a number of locations so that they can be refined before wider roll-out. An initial pilot would provide early evidence of the disadvantages and advantages of the proposed approach, while a subsequent roll-out to further pilots will test differing local circumstances.

The Study recommends the following steps, which should be undertaken under the guidance of the RDG:

- Develop criteria to assess which routes are suitable for the lower-cost approach. The criteria would include:
  - route or routes that would have a degree of segregation from the core network – the greater the segregation, the greater the potential to reduce costs;
  - using a franchise re-letting point to restructure the constituent parts so that local routes could be separated from the existing franchise; and
  - the appetite amongst PTEs and other local bodies to play a greater role and adopt the principles outlined by the Study.
- Develop a specification for the routes while recognising that the specific service philosophy would be a matter for the local operator.
- Assess the likely cost reductions that a local operator might expect by adoption of the principles outlined by the Study.
- Identify the standards that need to be changed – and those that would remain – as part of the process for standards reform described in the Study's review of standards.
- Develop minimum national standards for lower-cost regional railways.

In addition the Study recommends that:

- the rail freight industry should identify routes where there is no prospect of freight activity or where freight operating characteristics can be changed – these routes can be added to the other regional routes as candidates for low-cost operation; and
- a senior industry figure should be appointed, possibly responding to the Rail Delivery Group, to lead the following workstreams:
  - develop an implementation plan, linked into the franchising re-letting programme, and integrated with the Study's implementation plan;

- lead the work on reviewing the standards that should apply to the lower-cost regional railway, drawing on best-practice from other railways and in consultation with operators and infrastructure managers;
- identify suitable pilot routes, covering a range of market and operating scenarios; and
- develop a franchising or concession model that will deliver the benefits.

A small team should support the leader, who would draw advice from a stakeholder group represented by the passenger and freight operators, the infrastructure manager, and relevant PTEs and local authorities.

20. Competition and contestability

20.1 Overview of competition in the GB rail sector

Competition can produce significant benefits. It can increase efficiency, lower prices, ensure that the range of products reflects the tastes of consumers and increase innovation.[101] For example, the introduction of competition into the European air market ultimately led to a halving of air fares and the development of a new way of doing things through the development of low-cost airlines.[102]

Competition occurs in various ways throughout the GB rail sector:

- competition between companies for franchise contracts;
- competition in the rail freight sector, both between companies for contracts and with road transport; and
- competition between suppliers and contractors bidding for contracts, for example most renewals and enhancement work undertaken by Network Rail (NR) is subject to some form of competitive tendering.

Competition is not evident throughout the railway, most notably:

- there is typically limited or no competition once a franchise has been awarded, as the degree of on-rail competition (e.g. on station-to-station flows) is limited although there are some minor exceptions. The degree to which franchise competition leads to innovation is constrained by detailed franchise specifications, although the Department for Transport's (DfT) reforms and the Study's recommendations go some way to addressing this; and
- there is a lack of competition across much of NR's network. For example, all maintenance and operations work is undertaken in-house, and even where contracts are put out to tender (e.g. renewals) these are usually specified in detail, limiting the scope for innovation.

20.2 On-rail competition in the GB rail sector

On-rail competition can occur between:

- franchised operators – for example, there is competition for travel between London and Birmingham, where Virgin Trains operate fast InterCity services, London Midland, offering slower,

101 Geroski, P. A. (2004) *Is Competition Policy With It*. London: Competition Commission. This document can be accessed at www.competition-commission.org.uk/our_peop/members/chair_speeches/pdf/geroski_uea_140904.pdf.

102 Davies S., Coles, H., Olczak, M., Pike, C. and Wilson, C. (2004) *The Benefits of Competition, Some Illustrative Case Studies*. London: DTI. This document can be accessed at www.berr.gov.uk/files/file13299.pdf.

stopping services via Northampton, and Chiltern Railways, which operates by a different route; and

- franchised operators and an open access operator (an operator with access rights, but no franchised contracts), such as competition between East Coast and First Hull Trains on travel between London, Grantham and Doncaster.

Where there has been on-rail competition it has tended to lead to lower prices, higher patronage and some service innovations.[103]

On-rail competition has been limited for two principal reasons:

- Franchising authorities, in particular the Strategic Rail Authority (SRA), have tended to remove overlaps between franchises. This was primarily to improve operational performance, but it also had the benefit of increasing the price paid by franchise bidders as the extent of monopoly rights awarded to the winning bidder was greater.
- The Office of Rail Regulation's (ORR) policy has moderated the impact of on-rail competition, which is currently undertaken by applying the "not primarily abstractive" test. This does not allow open access service to operate if they would be primarily abstractive of an existing franchised operator's revenue. The principal reason for this test is to protect Government premiums and subsidy to franchised train operations, and has resulted in open access operators tending to operate services to new destinations, such as between London and Hull, Bradford and Sunderland.[104]

The scope for expansion of on-rail competition is determined, to a large extent, by the degree to which Government would accept reduced revenues from franchise competition. It is unlikely that the Government would be willing to see a large expansion of on-rail competition while it continues to provide such a large financial contribution to the rail industry.

However, some franchises, most notably InterCity East Coast, are likely to produce a net financial surplus over the next few years and this raises an issue over whether passengers on these services should be cross-subsidising other users of the network, particularly where rail is competing with other modes of transport. It might be possible to make changes to the way in which open access operators are charged for access to the network to minimise the impact on Government, and further work will be required to assess the potential scope of any required changes. Nevertheless, network capacity is likely to constrain the extent of on-rail competition, and therefore it is likely to remain focused on InterCity routes, where there is greater potential for new services.

Higher levels of on-rail competition are likely to increase the number of train operators that NR has to deal with, particularly at a route level. This could affect the drive to obtain closer NR and Train Operating Company (TOC) co-operation to secure efficiency. Although this could be less of an issue on long-distance routes, which are already served by multiple operators, significant on-rail competition in London and the South East would pose challenges where NR routes tend to be served by a single dominant operator.

103 Arup (2009) *On-rail Competition Analysis, Key Findings*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/access-policy-review-open-access-report_jan10.pdf.

104 Hull and Bradford had very limited direct services to London before the introduction of open access operations.

20.3 Increasing competition and contestability

The Study's recommendations provide a significant opportunity to increase contestability in areas beyond on-rail competition, particularly within infrastructure asset management, where the Study proposes the introduction of diverse ownership and/or management of route-level concessions. This would increase the contestability of infrastructure Operation, Maintenance and Renewals (OM&R) and some enhancement expenditure. This could allow the introduction of new techniques that would increase efficiency and reduce costs.

In addition there is significant scope for increased contestability within NR. This is supported by NR's recent policy statements on major projects, the national delivery service and the general aim of undertaking activities in-house only where it is clear that it is best placed to do so.

21. Ownership change

21.1 Background

The rail industry was privatised during the early 1990s under the Conservative Government – in principle, to open the industry to competition and market forces to encourage efficiency and reduce public expenditure.

The rail industry was split into 25 specific passenger service groups let by competitive tender for between seven and fifteen years, three rolling stock leasing companies to service the main capital expenditure requirements for the franchises, a number of privately-owned rail freight businesses, and an infrastructure owner and operator to be kept as a regulated monopoly.

As the Government still has a major role in running and funding the rail industry, and cost efficiencies have reportedly been difficult to achieve, some stakeholders have suggested that value for money could be improved if the entire rail industry was renationalised.

Other stakeholders have argued for more widespread, and early, introduction of private capital. Still others have advocated the amalgamation of many or all of the Train Operating Companies (TOCs) into a single organisation, with some suggesting that the TOCs and Network Rail (NR) should all be in one organisational unit.

21.2 The Study's approach

The Study takes a pragmatic, rather than political or doctrinaire, view of these options. The issue which the Study has been asked to address is essentially how to reduce the industry's costs and improve value for money. The Study is of the view that major cost reductions and value for money improvements can be achieved without sweeping away most of the present structure – this latter course of action would take years to complete, cause major diversion of effort, incur massive costs, and delay progress on improvements that are now being initiated or which could be initiated in the relatively near future.

In other words, the "present value" of the improvements that can be made, and hence the potential benefits to passengers and taxpayers, will be much greater if existing structures and interfaces are adapted and incentivised to deliver. Furthermore, the Study considers it unlikely that creating large monolithic organisations is the route to greater efficiency in the railway, provided that the alignment and effectiveness of existing interfaces and incentives are improved.

21.3 Private investment

The Study does not advocate changing the status of NR as a Company Limited by Guarantee (CLG). However, as described in more detail in Section 24, there may be opportunities for introducing unsupported debt or an element of risk capital equity into NR once the necessary preconditions have been met, i.e. the future structure of the industry is clearer, the financial track record and risk profile of NR are established and the necessary asset information base is in place.

Accordingly, such means of introducing equity risk capital are unlikely to be available in the near term, but should be kept under review.

21.4 Renationalisation

A number of arguments have been put forward to support renationalisation.

First, the costs of the rail industry have increased since privatisation. It is argued by some that this shows that privatisation has not achieved its overarching objective of cost efficiency through competition.

Second, Government still provides large subsidies to the rail industry, with some of this money being paid to shareholders in dividends, which is therefore lost to the industry.

Third, it is argued that renationalisation would create a simpler structure with a unified, vertically-integrated organisation with top-down goals and common objectives. This could reduce the duplication of functions across the industry and allow economies of scale/scope to be maximised. There could also be a reduction in transaction, legal and consultancy costs, as there would not be the same level of external procurement and matters such as discussions with the trade unions could be dealt with nationally rather than by many separate companies.

Finally, owing to the nature of the rail industry, ongoing Government involvement is needed to regulate the private monopolies within the industry. This means it is unlikely that the industry will ever run as an effective privatised industry.

The Study has considered these arguments and the key issues below.

21.4.1 Cost efficiency

One of the primary advantages of the privatisation of nationalised industries has normally been the increase in efficiency as companies compete for contracts and then aim to make profits for shareholders. However, in the rail sector, privatisation does not appear to have led to the cost reductions seen in other privatised industries, many of which have seen an initial average reduction of 4–6% per year in operating costs.[105] The Study's analysis of the barriers to efficiency improvement in GB rail are set out in this report.

Some stakeholders have argued that cost efficiencies have been difficult to achieve as British Rail was efficient. Smith, Nash and Wheat[106] compared the efficiency of British Rail with other international railways. They find results to be inconclusive, with studies ranking British Rail as the most efficient, others as the least efficient, and some about average. However, they conclude that there is no strong evidence that British Rail was any more efficient than its international peers.

The efficiency performance since privatisation has been mixed. The Office of Rail Regulation's (ORR) international benchmarking has shown that Railtrack's/NR's efficiency declined initially between 2000 and 2006 compared with European benchmarks, but has since improved and efficiency is targeted to match those of the top-performing European operators at the end of Control Period 5 (CP5)[107], albeit this has yet to be achieved. The Study's own international

105 Oxera (2008) *Network Rail's Scope for Efficiency Gains in CP4*. Oxford: Oxera. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-oxeraeffic-160408.pdf.

106 Smith, A., Nash, C. and Wheat, P. (2009) *The Effect of Passenger Rail Franchising on Costs: Evidence from the Passenger Rail Sector in Britain (1996 to 2009)*.

107 The benchmarking results for the period between 1995 and 2000 are unreliable.

benchmarking of TOC costs shows that GB rail costs are comparable to, if not below, those of state-run operators in Europe.

Given the cost reductions seen in other sectors from privatisation, it seems unlikely that renationalisation would lead to a reduction in costs. As argued elsewhere in this report, it is the extensive involvement of Government that has, to some extent, prevented the cost reductions seen elsewhere.

Furthermore, where Government has taken control of aspects of the rail system, costs have tended to increase rather than decline. For example:

- Smith and Wheat (2009)[108] show that where Government has been directly involved in TOC contracts, for example where TOCs were put on management contracts or had their contracts re-negotiated, there was deterioration in efficiency. They found that, on average, the efficiency of TOCs on management contracts was 1.8% per year worse than other TOCs. By the end of the period that TOCs were on alternative arrangements, their costs had risen by 16% relative to those that had remained on standard franchise agreements.
- The Office of the PPP Arbiter report assessed the relative performance of the PPP Infracos, Bakerloo/Central/Victoria and subsurface lines (BCV/SSL), which had been in public control since 2008, and Tubelines, which transferred to public control in 2010. This found that since BCV/SSL had been brought into public ownership, cost performance had got worse, and was moving away from the benchmark range (although the opportunity for reduced costs was significantly greater). Tubelines' costs were examined before public ownership and showed a significantly improving cost trend in 2008 and 2009, with costs approaching benchmark levels.[109]

Evidence from other sectors also suggests that private ownership is more efficient than public:

- equity-owned water and sewerage companies are, in general, more efficient than their state-owned counterparts;[110] and
- between 1995 and 2007 private-sector services' productivity improved by 4.7%, whereas Government services declined by 12.6%.[111]

21.4.2 Payments to shareholders

As private firms aim to increase profits, it is argued by some stakeholders that this drains the rail industry of investment as dividends are paid to shareholders rather than being reinvested into the industry. Therefore, this argument suggests that the subsidies paid for the service are higher than necessary to cover its costs to allow companies to make a profit.

However, this argument assumes that the cost of services would be the same if they were provided by a public- or private-sector company. Private companies should be incentivised to reduce costs to create a profit and it seems likely that the Government would need to pay the same, if not more, for these services due to inefficiency in a nationalised industry. This appears to be supported by the Study's international benchmarking of TOC costs and evidence from other sectors.

108 Smith, A. and Wheat, P. (2009) *The Effect of Franchising on Cost Efficiency: Evidence from the Passenger Rail Sector in Britain*.
109 Office of the PPP Arbiter (2010) *Final Benchmarking Reports*.
110 Ofwat (2010) *Financial Performance and Expenditure of the Water Companies in England and Wales 2009–10*. Birmingham: Ofwat. This document can be accessed at www.ofwat.gov.uk/regulating/reporting/rpt_fpe_2009-10.pdf.
111 EU KLEMS data as cited by LEK (2011).

Furthermore, the scale of TOC and Rolling Stock Company (ROSCO) profits is relatively small in relation to the overall costs of the industry. In 2009/10 combined profits of TOCs and ROSCOs were around £400m, which was around 3% of total industry expenditure. This is a significant reduction compared with 2007/08, when profits peaked at around £900m, reflecting the impact of the economic downturn. TOC profitability is relatively low, with a typical operating margin of 3–5%. NR also makes profits, although these tend to be reinvested in the network. In general, rail contributes a small proportion to the overall profits of transport groups and, consequently, the payment of dividends. The efficiency improvements from private-sector involvement are therefore likely to significantly outweigh the costs of paying dividends to shareholders.

21.4.3 Other issues

Renationalising under a single body could in theory provide benefits in terms of economies of scale and scope, ensuring co-ordination, removing duplication and harmonising terms and conditions. However, there could also be significant drawbacks in terms of:

- even with one national organisation there is likely to be a need to develop disaggregated business units within this structure for management to be effective, reducing the potential saving in interface costs;
- budgetary certainty is likely to decrease as NR is unlikely to benefit from the security of funding currently provided by the High Level Output Specification (HLOS) and periodic review process;
- renationalisation would require the Government to incur huge costs from buying the industry and all its assets back from private firms;
- the Government would inherit the debts of the rail industry, with NR's debts back on the Government's balance sheet; and
- EU legislation is unlikely to allow the transfer of assets into a single (nationalised) public body, as separation will still be needed between train operations and timetabling, reducing some of the potential advantages of economies of scale and scope from renationalisation that are suggested above.

21.4.4 Conclusion on renationalisation

In conclusion, as this report has set out in detail, there have been many barriers to efficiency under the privatised structure, including the extent of the fragmentation of structures and interfaces and increased Government involvement. However, the Study considers that the package of proposals included in this report could significantly increase the effectiveness of the industry. Furthermore, many of the arguments for renationalisation are formed from the failings of the existing system, and the Study considers that much more can be gained by improving the performance of the current system rather than embarking on a costly programme of renationalisation, which is unlikely to lead to an overall reduction in costs.

22. Infrastructure asset ownership

22.1 Introduction

The ownership of infrastructure assets will be a critical factor if the structure of industry is to be modified, for example through the introduction of vertically-integrated or infrastructure management concessions. Within the potential industry structure there appear to be three options for the ownership of infrastructure assets:

- assets are owned by the companies undertaking maintenance and renewal of the network – this is the current situation with Network Rail (NR) and would be the situation if the route infrastructure/vertically-integrated companies are sold to a separate company;
- NR maintains ownership of the assets while asset management is concessioned to a separate private-sector company, for example through medium- or long-term contracts; and
- public ownership, where ownership of the assets is transferred to the public sector, for example, a public trust which becomes the owner of the asset and contracts with other companies to manage the assets (as is the case on High Speed 1 (HS1)).

The following sections examine the potential impacts and considerations when splitting asset ownership and management. This draws extensively on work that the Study commissioned from First Economics.[112]

22.2 Ease of transition

In some respects splitting ownership and asset management could make transition to a new structure simple and quicker to implement. For example, the current proposals to transfer responsibility for franchised stations from Network Rail (NR) to train operators is being considered on the basis of a full repairing lease as it removes the need to transfer ownership from NR to train operators. Any outright transfer of assets is likely to be legally complex, potentially time consuming and might need primary legislation.

22.3 Increased contestability

Splitting asset ownership and asset management increases the opportunity for contestability, as it would allow the maintenance and renewal of the assets to be put out to competitive tender at the end of each concession period. This would ensure that a competitive price is received for maintenance and renewal of the network. Longer-term concessions would reduce the frequency of competitions and can lead to information asymmetries where the incumbent has much greater knowledge of the condition of the assets than other bidders. In theory contestability would therefore be maximised if there are repeated shorter-term concessions for asset management.

112 First Economics (2010) *Infrastructure Asset Ownership*.

There is, however, a trade-off between contestability and co-ordination and regulation costs. Any concessionaire would try and optimise the asset management strategy for the life of the contract, rather than on a whole-life basis.[113] An issue is that, while the degradation of some assets is visible or easy to monitor, for other assets it is more difficult to identify and can lead to disputes over responsibility. Consequently, if contracts are too short, then the asset owner may want to carry out intrusive checks to ensure that assets are being maintained on a whole-life basis.

One way to reduce the concerns over asset stewardship, while minimising the scope for interference by the asset owner, is to separate the monitoring role from the asset ownership and management roles. The monitoring role could be undertaken by a separate company appointed by the asset owner or, to ensure neutrality, could be subject to independent regulation.

The problem of separation of asset ownership and management can be illustrated by NR's approach to third-party enhancements where there have been allegations of risk aversion, a lack of a "can-do" attitude and an over reliance on asset protection agreements.[114]

Further problems are highlighted by the experience of the Public Private Partnership (PPP) Arbiter, where there was a separation between the asset owner, London Underground, and the private infrastructure companies (Infracos) Tubelines and Metronet. In the *OPPA Close Out Report*,[115] the Arbiter states that:

- there was a reluctance from the Infracos to invest in one Control Period in order to lower costs in future periods because the contractual drafting implied that all the benefits would accrue to London Underground (para. 3.27);
- disagreements between the level of transparency of costs, with London Underground seeking levels of transparency that the Infracos were unwilling to accommodate (para. 3.29);
- London Underground's standards were more onerous than those of other international metros and prevented reductions in costs by the Infracos (para. 3.32);
- disagreements about the scope of work, which delayed the work of Metronet in particular (para. 3.30); and
- in many cases the contractual drafting was unclear, with a cumbersome process for accepting even minor changes, with a licensed approach being considered as much easier (para. 3.17).

In the end, tensions between London Underground and the Infracos led to the demise of the PPP arrangements and the transfer of infrastructure maintenance and renewal back into the public sector.

These problems highlight the tension between contestability and the effectiveness of separating infrastructure ownership and management roles. If asset management contracts are too short, the asset owner may be too intrusive to allow the asset manager freedom to reduce costs. However, if they are too long, then, while the asset owner has less day-to-day interest in the condition of the assets, the benefits of competition are reduced and there is increasing reliance on regulation to obtain cost reductions. One way forward is to have a long lease from the asset owner that is then competed at regular intervals. This is reflected in the Association of Train Operating Companies (ATOC) proposals for stations where NR would let a full repairing 99-year lease to a franchised

113 For property leases this is dealt with via dilapidations clauses, security deposits or a mixture of the two.
114 Office of Rail Regulation (2009) *Policy Framework for Investments – Obstacles to Investment Conclusions*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/investment_obstacles_conclusions_310309.pdf.
115 Office of the PPP Arbiter (2010) *OPPPA Close Out Report*.

train operator. At the end of the franchise, responsibility would transfer to the new franchisee, ensuring repeated competition for the management of the asset. Ideally, in order to encourage a whole-life cost approach to asset management, franchise length would be a similar duration to asset life, which is typically 30 years for main railway assets such as track. This would imply lengthening existing franchise contracts, which are typically seven to ten years.

22.4 Public interest

In a situation where asset ownership is separated from asset management, the public interest must be safeguarded if Government requirements are clearly stated and at a very high level (e.g. the high-level operational performance conditions in the HS1 concession agreement) and enforced by a third party, in the case of HS1 this is through the ORR.

22.5 Conclusions

The Study considers that, within the structural changes being proposed, there might be merit in separating infrastructure ownership (by the central NR structure) from management at route level, as this would ease transition and could maximise the benefit to the public exchequer through contestability. However, any separation would need to avoid the problems of some previous attempts. This would mean that:

- the asset management concession contract should be reasonably long term, for example up to 30 years;
- there may be a case for a long-term concession from NR, for example 99 years, which is then transferred between competitive 30-year asset management concessions;
- considerable care needs to be taken in defining the extent of the asset owner's interest in the asset;
- any ownership company is kept at arm's length from Government, with Government focusing on high-level strategy to ensure that industry properly takes the lead; and
- the management of the asset is subject to independent regulation through a licence rather than through the actions of the asset owner.

23. Financial transparency

23.1 Overview

23.1.1 Background

The rail industry is rich in data – ranging from detailed attribution of delay minutes, sophisticated fare modelling tools, asset performance data and detailed TOC cost/revenue projections. An important issue, however, which has a bearing on the efficiency of the sector, is that many of these data sets are intended to suit a specific purpose and are not optimised, or shared, to help deliver value for money in the sector as a whole. This is especially the case with Train Operating Company (TOC) and Network Rail (NR) cost and revenue data.

The split responsibility for industry regulation, with the Department for Transport (DfT) managing franchises and the Office of Rail Regulation (ORR) regulating NR, can also lead to a lack of joined-up analysis/transparency of costs across the train/track divide. Indeed, the 2004 White Paper *The Future of Rail* identified that the lack of whole-industry information on costs was a contributory factor to increasing costs and poor performance. Furthermore, given the level of public subsidy to the industry, it is in some ways surprising that public information on costs and subsidies is so limited

At present, financial transparency takes the following forms:

- NR – as with other regulated sectors, the ORR collects, analyses and monitors detailed financial data from NR. It does this during the periodic review process and as part of its regular monitoring role. The challenge for the regulator (and NR) is that, because NR is configured as a national organisation, the benchmarking/challenge role which can be used in other regulated sectors, is more difficult. Furthermore, it is difficult to compare total industry costs (both NR and train operators) and revenues on anything other than a national basis; and
- Train Operating Companies – TOCs themselves have detailed profit and loss statements, some of which are shared on a monthly basis with the DfT. In addition, as part of its franchise procurement process, the DfT prepares a data room which contains detailed information about previous franchise/industry costs and revenues.

The DfT receives detailed cost and revenue data from bidders, which are assessed as part of the franchise letting process. This is normally in the form of a financial model which is used to compare bids from the private sector. This approach is aimed at getting the best value for money return in relation to franchise procurement. From it, the DfT derives a model which, in turn, is used to inform subsequent in-franchise negotiations. Some data are therefore transparent to the DfT as part of its contract management work, but this is not available publicly in detail or to NR as it is considered to be commercially sensitive.

The Greater Anglia franchise contract in operation at the present time (the first issued under revised Strategic Rail Authority (SRA) arrangements in 2004) goes further, in that it includes the concept of an "efficient operator" and a requirement to provide data in considerable detail. This sort of approach could have been developed for comparative benchmarking, but was not pursued

in other franchises, presumably on the basis that it could have been seen as "micro-management" of contracts.

23.1.2 Benefits of improved financial transparency

The Study proposes including in current franchise contracts a requirement to provide consistent, and publishable, financial data. While current financial transparency arrangements may fit, to some extent, with the way in which the ORR regulates NR, and the DfT manages franchises, the lack of publishable financial data constrains the scope for benchmarking or well-informed debate across the industry.

An underlying theme of the Study's findings is that improved value for money behaviours can be driven by improved financial transparency of NR's regional business units – allowing stronger challenge/benchmarking – and better co-ordination/cost control from joint-working arrangements with TOCs. Exposing train operators to changes in NR's costs should incentivise train operators to work with NR to reduce those costs. NR could also be exposed to changes to train operator costs. Combined with revenue/demand risk sharing this would strengthen and align incentives. The result would be greater levels of efficiency and, by bringing the industry cost and revenue sides of the equation closer together, drive decisions to be made from a whole-industry perspective. Improved financial transparency, of both parties' costs, would aid this process.

In addition, the Study feels that NR's disaggregated costs and TOC operating costs should be brought together so that the total industry costs, revenues and subsidies can be identified on a TOC and/or NR route basis. This would allow a clearer picture of where Government is providing support, allowing it to stand back in areas where there is little or no subsidy.

23.2 Proposed reforms to improve financial transparency

The Study recommends the following:

- Splitting NR into individual business units, with separate price controls, could allow access charges to be set on the basis of local costs, which would facilitate more informed local decision-making. This could be enhanced by the removal of the network grant, so that subsidies are paid on a train operator, rather than whole-network, basis (with suitable protections for freight operators); and
- Publication, annually by the ORR, of profit and loss figures, by franchise and by route, to provide a much greater focus on costs, and properly informed public debate about the rationale for subsidy levels.

24. Private investment

24.1 Overview of private investment in the rail industry

While much of the GB rail industry is privately-financed (i.e. companies use private-sector debt or equity to finance their activities), around half of the costs of the rail sector are covered by subsidy.[116] In addition, while Network Rail (NR) is privately financed, its debts benefit from a Government guarantee.

The level of public funding and involvement can affect the degree of risk transfer to the private sector. Conventionally financed companies (those funded through a mix of debt and equity) generally face strong financial incentives to reduce costs and increase revenues and profits. Train Operating Companies (TOCs) are subject to such incentives, but are constrained by their specified outputs and fares regulation, which has tended to limit the extent to which they can pursue normal commercial objectives.

NR's parent company is a Company Limited by Guarantee (CLG) and NR benefits from a Government guarantee of its debt through the Financial Indemnity Mechanism (FIM). It is certainly arguable that NR's financial structure materially weakens the impact of financial incentives on NR.

Incentives act on the party that bears risk. For a conventionally financed company, corporate financial incentives are transmitted by the shareholders, who maximise their value by outperformance of regulatory targets, and debt holders, who are keen to avoid under performance to protect their payments. NR has members instead of shareholders, who obtain no benefit if the company outperforms, and NR's debts are guaranteed by Government, so the financial risk of underperformance rests with Government rather than debt holders,[117] resulting in a soft, rather than hard, budget constraint. The following sections examine possible options for the introduction of private investment into NR.

Private investment can be introduced in a number of ways:

- unsupported debt (debt without a Government guarantee);
- equity risk capital which can be raised via:
  - an initial public offering (IPO), sometimes called a flotation, where the shares are sold to the public;
  - a placement with institutional shareholders; or

116 Directly Operated Railways, which operates passenger services, and Direct Rail Services, which operated nuclear and other freight services, are both publicly-owned.

117 Office of Rail Regulation (2006) *Periodic Review 2008: Enhancing Incentives for Continuous Improvements in Performance*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/298.pdf.

– a trade sale where the shares are sold to a trade buyer – this allows the introduction of new management as well as private capital, and is maybe a preferable option if a step change in performance is required.

Several of the approaches may be combined.

24.2 Unsupported debt

24.2.1 Raising unsupported debt

Raising unsupported debt could improve NR's financial incentives by introducing a hard budget constraint. For example, if a limit is placed on the amount of debt covered by the Government guarantee and all remaining debt has to be raised without Government support, then this transfers the risk of cost overruns from the public to the private sector, thereby creating a hard budget constraint.

The underlying aim of raising unsupported debt would be to transfer risks from the Government/taxpayer to debt holders and increase external scrutiny of NR from lenders having money at risk. The full benefits would only come if investors believed that there was real risk transfer.

On behalf of the ORR, consultants NERA estimated[118] that a significant tranche of unsupported debt could improve NR's achievement of efficiencies by around 0.5% per year for a Control Period (equivalent to an annual saving of around £100m after five years). As part of the last NR periodic review (PR2008), the ORR concluded that the improved efficiencies from unsupported debt would outweigh the additional costs and so required NR to raise unsupported debt over the current period (2009–14).[119] However, in December 2010 the ORR stated that, due to the uncertainty around structural options going forwards, in part as a consequence of this Study, they considered that NR should not issue unsupported debt at the current time and would return to the issue once there was sufficient clarity on possible structural reform.[120]

24.3 Equity risk capital

24.3.1 Potential benefits of equity risk capital

Equity risk capital has a number of advantages over unsupported debt (whether it is introduced in whole or as a minority position):

- equity holders are likely to place greater pressure on NR to outperform regulatory settlements as they will directly benefit (through higher share prices and dividends);
- risk transfer (i.e. primarily cost overruns and underperformance against efficiency targets) from Government to the private-sector is greater; and
- the sale of shares will realise proceeds for Government.

118 NERA (2006) *Corporate Form, Financial Guarantees, and Efficiency Performance: Expectations and Evidence*. London: NERA. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/pr08-isbp-nera.pdf.

119 See Paragraph 14.9 in Office of Rail Regulation (2008) *Periodic Review 2008: Determination of Network Rail's Outputs and Funding, 2009–14*. London: ORR. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/383.pdf.

120 Letter from Paul McMahon to Patrick Butcher, December 2010. *Unsupported Debt*. This document can be accessed at www.rail-reg.gov.uk/upload/pdf/unsupported-debt-letter-161210.pdf.

The potential advantages of equity over unsupported debt can be seen by comparing the performance of Welsh Water (which is only financed through unsupported debt) and the other water and sewerage companies (which are financed through a combination of debt and equity), which suggests that equity may improve performance, although other factors will also be at play. Ofwat classes Welsh Water and state-owned Northern Ireland Water as less efficient than the leading private-sector equity-owned water companies in England and Wales.[121]

There are, however, a number of further considerations before risk capital is introduced into NR, as described below:

- Transfer of risk – risk capital is only likely to have benefits if there is real risk transfer to equity holders. For risk transfer to be effective, equity holders must perceive that NR could fail and that the Government would not step in by providing additional subsidy. This is essentially a decision for Government.
- Size of equity stake – the potential equity stake which could be as large as £18bn (measured by Regulatory Asset Base (RAB) less debt) is much larger than the IPOs for a typical listed utility with average equity of £2bn–4bn. There may be a case for introducing a minority equity stake into NR or into a specific part of NR, for example under the independent ownership proposals outlined in Section 7. Having a number of different equity backed companies may reduce the risk of failure (as performance could be more easily benchmarked) and it might be possible for one of the companies to take over another if it appears to be failing.
- Cost of equity – a key issue is whether the improved efficiencies generated by private equity, together with the value of risk transferred, exceeds the return required on equity capital. There would also be a time lag, as the additional capital costs would accrue instantly and efficiencies may take some time to build up, which could impact on the near-term affordability of the railway. Most utility companies have equity risk capital and have delivered significant efficiencies (e.g. average real unit operating cost improvements of 4% to 6% per year), but it is important to note that these improvements will also reflect factors other than equity, and that the picture is not consistent across all such companies.
- It is noted also that NR's permitted return currently includes a notional equity return component in the ORR's Weighted Average Cost of Capital (WACC) calculation. This is reinvested in the industry through the Ring-Fenced Fund.
- Quantum of subsidy – a related issue is that around 40% of total rail industry costs are met through public subsidy and investors may have concerns about the future security of this income. With HS1, investors sought some form of guarantee for franchised service levels and therefore income, which could have otherwise impacted on the sale price.
- Timing – private equity can provide efficiency benefits. However, it is important that NR does all that it can to improve efficiency before private equity is introduced, otherwise the taxpayer will not gain the full benefits.

121 Ofwat (201) *Financial Performance and Expenditure of the Water Companies in England and Wales 2009–10.* Birmingham: Ofwat. This document can be accessed at www.ofwat.gov.uk/regulating/reporting/rpt_fpe_2009-10.pdf.

24.4 Conclusions on private investment in Network Rail

In light of the above, the Study does not recommend the introduction of unsupported debt or equity into NR in the near-term.

Notwithstanding the potential advantages of improved corporate financial incentives, the Study considers that neither option (unsupported debt nor equity) would be appropriate until the future structure of the industry, the financial track record and risk profile of NR, and the necessary asset information base are firmly in place. Equity owners and debt holders require certainty, and the prospect of any major restructuring taking place while private equity and/or debt are introduced is unlikely to be attractive and would be factored into any sale price or cost of debt.

That said, a number of the issues highlighted above might be mitigated by the introduction of private capital into discrete parts of NR's business, particularly once any new arrangements have been implemented. The recommendations proposed earlier in this report to create smaller devolved route infrastructure managers could, therefore, offer scope to introduce private equity, if circumstances allow. It will therefore be important that any such business units are designed with a view to introducing equity in a commercial way. Furthermore, any vertical integration pilot would allow equity to be introduced through letting a combined infrastructure and train operations concession to a private company.

The Study recommends that unsupported debt could be introduced when the restructuring of NR is much further advanced. In addition, while private equity should not be introduced as a precursor to any reforms, it could be introduced as part of the changes (e.g. through a vertical integration pilot), and should not be ruled out from the rest of NR as the new structure develops. If appropriate, it could take the form of investment in discrete parts of the network which are less dependent on subsidy.

Finally, the Study notes that the capital structure of the infrastructure provider is likely to be a relevant issue for the ORR in considering the appropriate funding framework for the next periodic review. As the strategy and the shaping of the periodic review will become clearer over the next year, it is likely to be necessary for NR, the ORR and other stakeholders to carry out further preparatory work for any plan to issue risk capital during CP5.

25. Legal background

25.1 Introduction

This section gives an assessment of key legal issues arising in relation to the reform package proposed in the main body of the report and which will need to be taken into account in implementing these proposals.

Key areas of the Study's reform package, where potential issues to be addressed arise, are as follows:

- a "base case" of NR reform consisting of regional accounting separation of NR, regional efficiency benefit share, and cost and revenue sharing across the wheel rail interface, potentially supplemented by published joint profit and loss accounts;
- a possible further tranche of reform, with the possibility, in certain circumstances, of horizontal separation, vertical alignment or vertical integration; and
- a package of radical franchise reform.

Outlined below is the Study's assessment, prepared in consultation with the Department for Transport (DfT) and the Office of Rail Regulation (ORR) legal experts, of the relevant issues. The Study recommends that full legal advice will be needed as proposals are worked up and taken forward to be implemented.

25.2 Key issues to be considered

25.2.1 Network Rail restructuring

Any structural changes to the industry, such as horizontal or vertical separation or the creation of equity interests in the infrastructure business, would need to be assessed for their compatibility with restrictions in Network Rail's (NR) constitution relating to investment of profits, asset transfers, joint ventures and finance agreements. There does not appear to be anything in NR's constitution that prevents joint venture, alliance or vertical integration approaches, although there may be limitations as to NR's ability to undertake train operations.

If the restrictions are barriers to reform, consideration would need to be given to whether, and how, they can be addressed. Consideration is also necessary as to what amendments would be needed to the network licence and whether NR's financial agreements would need amending with the consent of third parties.

Any changes to NR's structure or relations with other industry bodies would ideally be carried out in collaboration with NR. Seeking to impose change, which would be undesirable generally, would be difficult and time-consuming, and, in certain circumstances, could necessitate the passing of an Act of Parliament, potentially following the lengthy and complex hybrid bills procedures (because of NR's legal status as a private company). Recent initiatives by NR suggest that an agreed way forward may well be possible.

The Study recommends that these issues are considered fully as part of any wider implementation plan related to the introduction of proposals in this report.

25.2.2 Public/private law

Consideration would need to be given to the EU and public law implications (including procurement law) of any transfers of parts of NR's businesses to third parties or to joint venture companies.

The extent to which such transactions are matters of public or private law would need to be assessed in more detail. The private law implications are that any restructuring proposals are likely to generate more detailed commercial issues. For example, third parties may need to agree to changes that affect NR's financial arrangements or interests in land. Such issues would realistically need to be analysed at a later stage, probably through a workstream led by NR, or the proposed Rail Delivery Group.

25.2.3 EU Directives

The UK is obliged under EU law to impose separation requirements on bodies responsible for the management of railway infrastructure and railway undertakings. Directive 91/440/EEC requires Member States to ensure that any body which incorporates both functions prepare and publish separate profit and loss accounts and balance sheet. That Directive, combined with Directive 2001/14/EC, also requires that those responsible for setting the charges for, and allocating access to, the infrastructure are independent from any railway undertakings. These separation requirements are transposed into domestic law by the Railways Infrastructure (Access and Management) Regulations 2005.

The proposals in the Study to introduce accounting separation on a regional or route level, rather than a national level, and to combine the train operator and rail infrastructure manager profit and loss accounts on a route-level basis would need to be structured or, if necessary, modified, so as to ensure compliance with these obligations.

There may also be issues to consider with regard to Train Operating Company (TOC) licences in any vertical reform where these will need to be consistent with the requirements of the Railway (Licensing of Railway Undertakings) Regulations 2005 implementing Directive 2001/12/EC.

It should also be noted that proposals published by the EU Commission in September 2010 for a "Recast" Rail Directive would, if adopted in their present form, strengthen the requirements for separation of infrastructure from other railway undertakings and could have the effect of making a number of the proposals for vertical alignment and integration more difficult to realise.

25.2.4 State Aid

Any reform package will need to be consistent with EU State Aid requirements. The corporate and financial restructuring of the organisation, operation and management of the GB rail infrastructure, which was proposed by Government after the financial failure of Railtrack (and resulted in the creation of NR), received clearance from the European Commission in 2002. The Commission concluded that the DfT's financial support for NR did not amount to State Aid for the purposes of the EU State Aid restrictions.

In implementing recommendations from the Study, the DfT will need to review the extent to which proposed reforms are consistent with the 2002 clearance or, if they are not, and other

models may well be possible, ensure that State Aid requirements are met on an alternative basis. State Aid issues will therefore need to be taken into account and tested as the design of the reforms is developed. If any clearances are required, the timescale for these will have to be taken into account in implementation.

25.2.5 Licence amendments

Any changes to the structure, and accounting requirements, of NR are likely to have to be reflected in the network licence. The Railways Act 1993 requires that any change to the licence must be done either with NR's consent or be implemented after a reference by the Office of Rail Regulation (ORR) to the Competition Commission.

The process for modifications with an operator's consent includes a statutory consultation of 28 days. In preparation, the ORR would normally expect to consult on any changes before moving to the statutory consultation. After this, it should be possible to introduce changes within nine to twelve months, assuming the consultation did not generate difficult issues.

The above analysis also applies to any modifications that might be required to train operator licences. However, it should be easier to implement licence changes for train operators as the agreement to a new form of licence could, in all likelihood, be addressed as part of the bidding process.

25.2.6 Franchise reform

EU procurement and State Aid requirements (particularly those in Regulation 1370/2007) provide for the open tendering of public services, so it would be relatively straightforward to implement reforms arising from the Study, as long as the following requirements were adhered to:

- franchises have to be let through a public service contract;
- that contract must be clear about the rights granted and the terms for compensation;
- compensation must be no more than the net financial effect (including a reasonable profit);
- it must be let through a competition; and
- franchises should be for no longer than 15 years unless exceptional investment requires a longer term.

Domestic legislation relating to franchising is found mainly in the Railways Act 1993, the Transport Act 2000 and the Railways Act 2005, and supporting orders and regulations. This legislation gives the franchising authority – the DfT – powers to include what it thinks fit in franchise agreements.

In implementing a reform package that includes longer franchises with greater scope for risk and benefit sharing, a lesser level of specification and, potentially, an element of fares deregulation, it will be important to ensure that the value for money of subsidy is clear. If the scope for the franchisee to make profit is too open ended, then, as well as being potentially poor value for money for the taxpayer, there will be a potential State Aid issue of overcompensation and the requirements of the EC Public Service Regulation (EC 1370/2007 at article 4) may not be met. There needs to be care, therefore, in designing not only the individual elements of the reform package, but also its totality to guard against this risk. Urgent consideration should be given to this issue in implementing the above recommendations.

25.2.7 A stronger role for the ORR in franchise management

It is possible for the ORR to enforce at least some of the provisions currently included in franchise agreements through train operators' licences (e.g. it has, in the past, enforced some consumer-related requirements). That said, given the current structure of franchise agreements, ORR enforcement of all provisions could face difficulties. For example, the duty to enforce public service obligations may not sit well with the ORR's Competition Act authority and licensing powers, where franchised operators may need to be treated differently. Any such move would therefore require an appropriate separation between access allocation and interest in TOC services as required by current (and proposed) EU legislation.

Wholesale management of franchises by the ORR would represent a major challenge. In addition to the above, there may also be issues of contract law, as the franchise agreements are between the Secretary of State and TOCs, and many of the provisions are commercial and it would be odd to expect the ORR to manage and incentivise delivery of somebody else's contract. Furthermore, under the Railways Act 1993 the DfT is nominated as a franchising authority and the expectation in the first instance might normally be for the franchising authority to enforce provisions under its contract.

As with the issues highlighted previously in this section, these would need to be addressed as part of the implementation of any package of reforms arising from the Study.

25.2.8 Rail Delivery Group/Rail Systems Agency

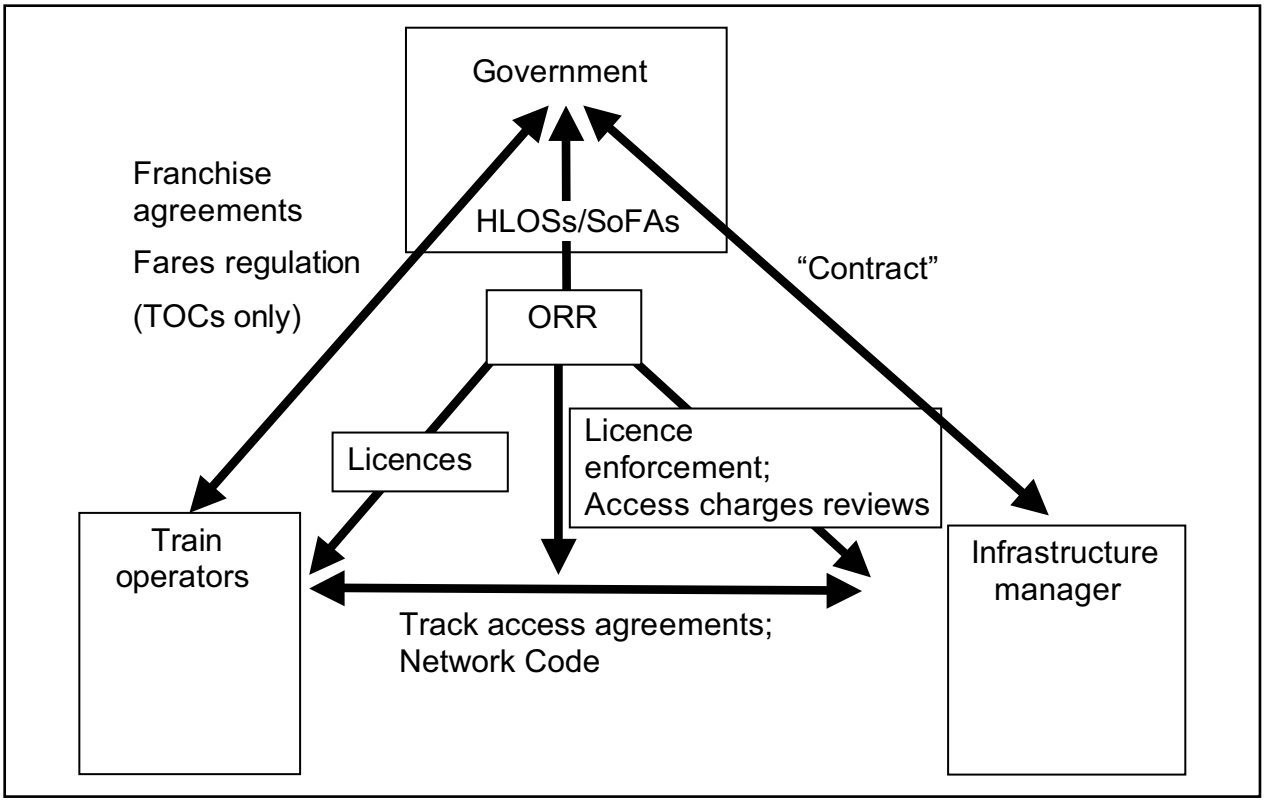
As proposals are developed, it will be important to ensure that the Rail Delivery Group's role and that of its principal participants are not such as to disadvantage smaller industry players or new entrants in any anti-competitive manner. Where the Rail Systems Agency (RSA) has a role in setting safety or technical standards, EU requirements for these to be notified in certain cases (e.g. under the Interoperability (2008/57EC), Rail Safety (2004/49/EC) and Technical Standards (1998/34/EC) Directives) will need to be met, again so as to ensure fair competition at an EU level.

26. Recommendations for regulation

26.1 The main forms of regulation in the railway

The structure of regulation in the rail sector is split between the two main regulatory bodies of the Office of Rail Regulation (ORR) and the Department for Transport (DfT), with other regulatory functions carried out by Transport Scotland in Scotland and other franchising authorities: Welsh Assembly Government, Transport for London (TfL) and Merseytravel. This is illustrated in Figure 26.1.

Figure 26.1: Structure of the rail industry



The ORR's key areas of regulation are:

- Network Rail's (NR) stewardship of the national rail network (monitoring and enforcing delivery of outputs set at a periodic review and other licence obligations);
- NR and train operator licences;
- approval of track, station, light maintenance depot access;
- undertaking periodic reviews of NR, setting NR's access charges and outputs;

- competition law breach investigations (concurrent powers with the Office of Fair Trading); and
- enforcing authority for the Health and Safety At Work etc. Act 1974 and other rail safety related legislation.

The DfT's key areas of regulation are:

- passenger train operator franchise agreements, which include:
  - minimum output requirements in terms of train frequencies, crowding and performance;
  - minimum standards, such as station opening hours, passenger information; and
  - change mechanisms, for example to reflect changes made following a periodic review or the Government-specified High Level Output Specification (HLOS);
- setting regulated fares, in particular:
  - season ticket prices for commuter flows in London and the South East;
  - Saver fares (off-peak walk-up tickets) for other services; and
  - monitoring actual fares within fares baskets;
- consumer protection.

26.2 Improving regulation

A principal focus of the Study is to improve the alignment across the industry so it is possible to view things in a whole-system way. To support this there is a need to overcome the separation of regulation between the DfT and the ORR. The lack of whole-industry regulation can be particularly important where delivery relies on whole-industry engagement, for example performance, cross-industry projects and whole-industry asset and supply chain management. The different approaches towards regulation where the ORR focuses on output-based regulation and the DfT has, in the past, relied on a high degree of specificity, can make change and whole-industry alignment difficult. The 2004 White Paper, *The Future of Rail*, identified that the lack of a whole-industry view on costs was a contributory factor to increasing costs and poor performance. Little appears to have changed since.

The dual regulatory approach can create tensions and a lack of whole-industry thinking. The Study considers that there should be a **move towards a single regulator for the rail industry**. It would be most appropriate for the single regulator to be the ORR, as independent regulation is an important enabler for the move towards the industry undertaking more and central Government less. The Study considers that the following changes would improve regulation and value for money.

26.2.1 ORR regulation of cross-industry outcomes

The 2004 White Paper called for more joined-up regulation and brought together the regulation of performance, safety and efficiency under a single regulator, the ORR. Apart from safety, the ORR does not directly regulate the cost and performance of the whole industry. The Study considers that it is therefore important that regulation across the industry is more joined-up, with the ORR regulating cross-industry outcomes. This would ensure that train operators and NR are held equally to account for their actions. This would involve moving the regulation of cross-industry outcomes

(such as performance, network availability, journey times and cross-industry projects) from franchise agreements into train operators' licences, which the ORR could then enforce.

26.2.2 ORR regulation of general passenger facing obligations

The Study considers that, in order to create more joined-up regulation, the ORR could enforce passenger facing obligations that are currently included in franchise agreements. This would be a return to the position immediately after privatisation, and would allow consistency of treatment across different franchise authorities.

26.2.3 ORR reviews of outputs and changes for train operators

As described in Section 5 the ORR should undertake reviews of outputs and payments to "rebase" Train Operating Companies' (TOCs) financial positions, making it possible to take account of external factors, to set a "fair price" for the latest HLOS changes, and to benchmark/challenge TOCs' performance on unit costs. Such a role could be provided under the existing advice and assistance role, or could become a formal part of the franchise agreement. Such a role could expand to providing advice on changes to regulated fares, so that, where passengers benefit and are willing to pay for enhancements, regulated fares are increased, reducing the cost to Government. This could help to ensure that investment better reflects the needs of users.

26.2.4 Impact of structural changes

The role of regulation is likely to need to adapt, with closer integration between track and train. At the lowest level of integration, cost and revenue sharing, the Study considers that the ORR would need to play a stronger role in the protection of minor users and freight (together with the role on the regulation of cross-industry outputs). As the level of integration increases, for example through vertical integration, the ORR's role in the protection of operators which are not integrated with infrastructure is likely to need to increase, with the need for the publication of more data and greater regulatory oversight of decisions, such as those on capacity allocation. In addition, as track and train become more integrated, there is likely to be a greater need for the ORR to regulate the integrated company and undertake fares regulation so that changes in costs can be reflected in regulated fares

26.2.5 Potential ORR regulation of fares

The Study considers that the ORR could also take on a role on the regulation of fares across all franchised services. This could allow fares to better reflect costs (particularly NR costs), encouraging more realistic expectations. This could allow Government to limit its exposure to changes in subsidy and allow it to step back further from the industry. Such a role would require Government to set a clear policy framework so that the ORR adequately takes into account any social or other policy goals.

26.3 The capability of the ORR

The largest single improvement in the ORR's capability is likely to be derived from the devolution and decentralisation in NR, and the resultant opportunity for comparative benchmarking of the decentralised units.

That said, the ORR will face a significant challenge in ensuring that it has the capability and the standing to fulfil the expanded role that the Study envisages successfully. This includes:

- working with new industry leadership structures in developing a stronger safety culture across the industry;
- monitoring the management and integrity of the overall change programme and providing authoritative views as to any weaknesses in process;
- refining regulation of NR in support of its drive to meet efficiency targets, and, where possible, reducing the burden of regulation on NR, assuming internal information and audit process improve to make this possible;
- monitoring the impact of structural changes, and ensuring that the interests of freight and other operators are properly protected; and
- extending the ORR's role to include:
  - monitoring and enforcing general passenger-facing obligations in franchise agreements;
  - benchmarking of efficiency across the industry;
  - regulation of the Rail Systems Agency;
  - reviews of outputs and changes for train operators; and
  - potentially, the regulation of fares (within policy set by Government).

The Study supports the recommendation in the recent National Audit Office (NAO) report *Regulating Network Rail's Efficiency* that, if there is any substantial change to the ORR's role, it should be prepared to undertake or commission a capability review. The Study recommends that such a review should consider, in particular, whether the ORR will have sufficient expertise in railway engineering and operations available within its Board and Executive.

26.4 The capability of the DfT

The Study recommends the transfer of some regulatory roles related to franchises, fares and possibly consumer protection from the DfT to the ORR. In planning any such transfer, steps will need to be taken to ensure that the DfT retains sufficient capability to carry out its role in franchising and its policy role on fares and revenue protection effectively.

27. Issues relating to value for money

27.1 Description of studies and analysis

This section considers the issue of whether/how value for money is optimised across the whole rail sector, specifically in the way decisions are made as to levels of Government support/subsidy. A feature of this work has been an assessment of how cost–benefit analysis (CBA) is used to support decisions on spending.

The Study has carried out extensive research and has held a number of interviews with relevant industry parties, with a view to identifying opportunities to improve value for money.

27.2 Evidence base

The primary sources of evidence for this section of the Study were:

- Booz and Company (2010) *Costs of Railway Outputs*;
- Booz and Company (2011) *Rail Value for Money Study: Research on VfM Assessment*;
- Atkins (2011) *Whole-system Programme Management*; and
- Steer Davies Gleave (2010) *Leadership, Planning and Decision-making*.

In addition, this section has been informed by the wider range of analysis and conclusions carried out for the Study.

27.3 Background information and key data

The Department for Transport (DfT) provides support for the rail industry in the following ways:

- direct grant to Network Rail (NR) for the provision of infrastructure;
- separate funding is identified for major schemes;
- franchise payments to Train Operating Companies (TOCs) to run rail services; and
- various other smaller payments to the Passenger Transport Executives (PTEs), Transport for London (TfL), Merseyside and the freight industry.

Value for money in the rail industry is currently assessed in a range of ways, including the following:

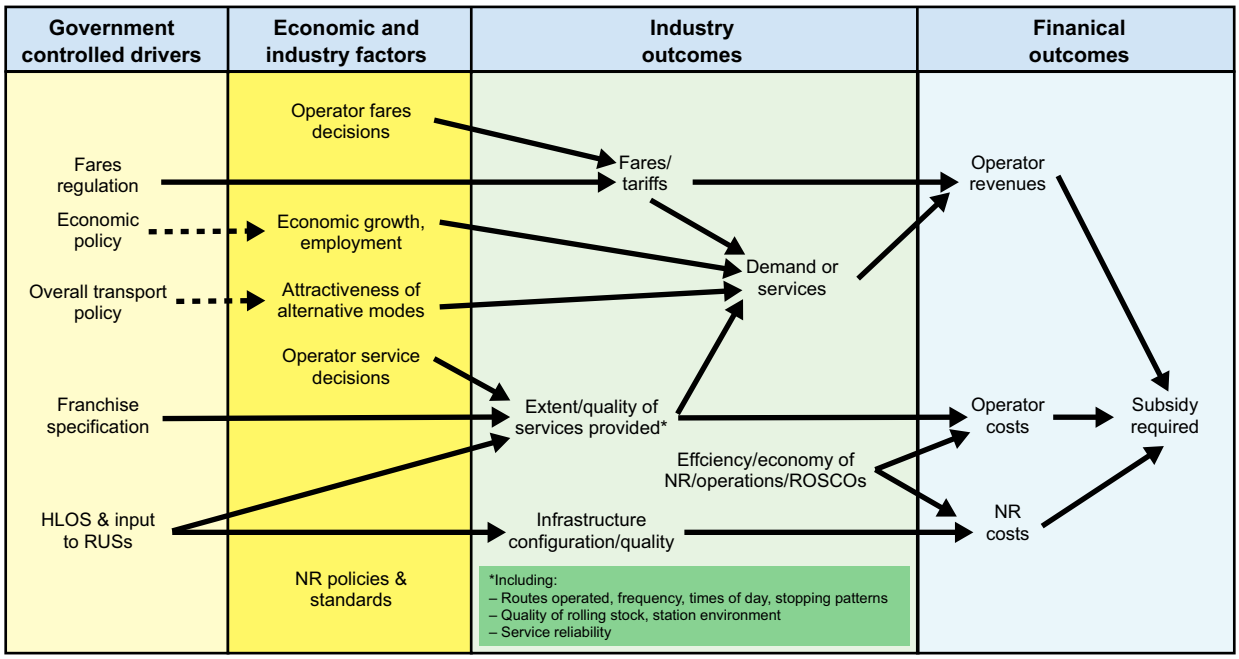
- proposed enhancement projects are assessed using a well-established CBA, which takes account not only of straightforward cost and revenue assessments, but also a range of monetised factors focusing heavily on the value of time;
- at the time each franchise is re-let, CBA analysis is used to determine the value for money of incremental changes to services;

- fares policies are assessed, taking into account value for money for fare payers;
- Office of Rail Regulation (ORR) efficiency reviews of NR (these define value for money in terms of economy and efficiency); and
- the National Audit Office (NAO) periodically reviews the performance of both DfT and the ORR in achieving value for money for the taxpayer.

However, although incremental changes are assessed in detail, no overall assessment is made of the value of money of the rail subsidy as a whole.

It is also important to note that the overall level of subsidy is not set in isolation. Indeed, it is not so much an *input* to the process, but the *product of* a complex number of drivers, as demonstrated in the illustrative model shown in Figure 27.1.

Figure 27.1: Complexity of drivers of rail subsidy



Note: this is a simplified model – not all drivers and relationships are shown

27.4 Barriers to efficiency

The Study has identified the following barriers:

- **A lack of clarity as to what Government support buys can lead to poor value for money across the system** – as highlighted in Section 5 Government subsidy buys desired increments over and above the "commercial railway", but a key barrier to improved value for money is a lack of clarity over what constitutes the "commercial railway". The focus of value for money assessment is on incremental changes, with no regular assessment of existing services, infrastructure and fares policies – or how much of the subsidy is paying for benefits outside the rail system.
- **Current value for money assessment, being based on CBA, does not always fully reflect Government's strategic objectives** – the CBA framework currently excludes consideration of some wider benefits (e.g. it does not fully take account of the benefits to patronage derived from having radial routes in a network) and, more significantly, is tuned to deliver the DfT's

previous Departmental Strategic Objectives, which, as is explained in Section 5 do not fully reflect its current approach; and

- **A lack of a co-ordinated plan for reducing subsidy over time, and the absence of a mechanism for ongoing control, is likely to lead to increased expenditure over time** – the High Level Output Specification (HLOS) process focuses on incremental changes to the status quo, and does not include a challenge to outputs already programmed into NR plans. In addition, most franchise subsidies are relatively fixed as a result of contracts already agreed, and even those franchises which are in the process of being procured are largely based on the service patterns "inherited" from the preceding pattern. Thus, funding processes – as currently managed – do not provide tight control over long-term subsidy growth.

27.5 Principal issues

27.5.1 Lack of clarity as to what Government support buys

Greater clarity would be provided if the DfT undertook a one-off assessment of the use of all Government funds in the railway. Booz and Company, in their work for the Study, have suggested that such a review could be carried out in the following three-step process:

- First, analysis of the principal uses of subsidy, by identifying and costing those elements of service provision, infrastructure provision and fares policy for which the market would not pay on a commercial basis, using a cost allocation approach.
- Second, identification of the costs which might be avoided if these services and other uses of subsidy were not provided. In practice, avoidable costs may be limited given the commercial interdependence between different services and network sections (e.g. London Outer against London Inner).
- Third, mapping the uses of subsidy to Government objectives, for example as shown in Table 27.1.

Table 27.1: Mapping the uses of subsidy to Government objectives (illustrative)

Use of subsidy	Allocated cost of this use	Avoidable cost of this use	Impact on Government objectives		
			Objective A	Objective B	Objective C
Provision of service on route X					
Accessibility of station platforms and vehicles					
Subsidised peak London fares					
Etc.					

Such an approach would have the benefit of "mapping" subsidy to value (outcomes), creating transparency and enabling genuine trade-offs over the alternative uses of subsidy – not to cut services, but to focus the minds of decision-makers on priorities for spending. Decision-making could then be based on a consistent assessment regardless of the nature of spend (e.g. investment project, maintenance activity or fares subsidy). Assessment could include CBA, but also a focus on the underlying reason for spend and how it contributes to Government objectives (e.g. "reduced journey time for existing WCML users" as opposed to "£4m of social welfare benefits").

27.5.2 Refining the current value for money assessment to more fully reflect Government's strategic objectives

This could be achieved through greater clarity of Government objectives, more effectively communicated and connected to operational targets and criteria.

27.5.3 A co-ordinated, national value for money improvement plan

This could be achieved through a single national plan for reducing DfT subsidy over time. It would require the DfT (in co-operation with the industry and other key stakeholders) to determine a plan for subsidy reduction, based on the above review of Government rail funds, and establish an ongoing monitoring system, with industry parties playing an active role in building up and assessing options.

27.6 Recommendations

The Study recommends the following:

- The next iteration of the HLOS/Statement of Funds Available (SoFA) process should reflect the Government's overriding objective of delivering greater cost reduction, as expressed in the DfT's current Business Plan, and include an explicit cost reduction output (as already recommended in Section 5).
- The DfT should review the CBA mechanism (also recommended in Section 5) – the Study notes that the DfT is currently completing such a review;
- The DfT should ensure that there is sufficient clarity in terms of Government's policies for rail, and between rail and other transport modes, to permit a clearer "line of sight" to objectives set for the rail industry and to strategies for implementation – in particular that there should be an explicit cost reduction objective;
- The DfT should develop, in the medium term, adequate transparency on subsidy – the DfT and the industry should work together to progressively unpick, understand and share with other decision-makers, farepayers and taxpayers a full analysis of what subsidy is buying. This is a major undertaking that could partly be aligned with the RUS and HLOS processes. However, the aim should be to have a reasonably complete picture within two to three years from now. The DfT should, in parallel, assess how the use of subsidy contributes towards Government's policy objectives.
- The DfT – with strong input from the industry – should create a national plan for value for money improvement and long-term reduction in subsidy, based on the above analysis and including the following features:

  - future needs of the railway to be taken into account;
  - future major spend decisions (including decisions to continue existing services or fares) to be tested using consistent value for money assessment and based on trade-offs between alternative uses of the funds;
  - HLOS process and franchise re-lets used to implement major service changes; and
  - adjustments made to the subsidy reduction plan as required, but avoiding frequent major reviews of strategy.
- In the context of the above, the industry should develop co-ordinated plans for cost reduction (also recommended in Section 5).
- The DfT to establish and implement a subsidy control process where individual programmes and subsidy allocations are managed centrally against the national plan.

27.7 Potential for, and timings of, cost savings

The recommendations above would be enablers for the detailed measures/savings outlined elsewhere in this report.

27.8 Implementation plan

Implementation of the above recommendations would be through action by the DfT.

28. Approach to implementation

28.1 Introduction – the management of change

Making significant changes within the GB rail industry in the timescales required will present major challenges for all concerned. However, delivery of each element of change does not require the GB railway industry to do more than has already been done in railways elsewhere or in other industries in the UK. The Study believes that the task facing GB rail is challenging, but achievable if all concerned play their parts. The keys to success will be building a powerful guiding coalition in support of a comprehensive programme of change, a good plan and the exercise of effective leadership in delivering that change.

The Study proposes a significant number of initiatives and within this section includes an implementation plan and structure that is designed to deliver transformational change in the rail industry. The Study has noted that valid recommendations from previous studies addressing similar rail industry issues have quite often not been followed through to implementation. Most notably the 2004 White Paper on railways has still to be implemented fully. The GB rail industry does not have a good record in this area.

Accordingly, the Study believes that the programme of change that the Study proposes should be driven by a dedicated resource.

28.2 A structure for change

For the Study's recommendations to be implemented successfully, the Study considers that the following are required to be in place:

- An independent programme implementation/management team that is tasked with planning, co-ordination, execution, monitoring and reviewing implementation across all elements of the industry through what are a complex series of recommendations.
- Resources appointed within this team that are proven "change agents" to facilitate action across the broad scope of the report recommendations.
- That this team, as soon as is practicable, should work with and, at a later date, be incorporated into, the Rail Delivery Group (RDG). This would allow a structure where change is led by the industry as a whole, through a coalition of the industry's most senior executives.
- A regular reporting and monitoring mechanism is established to the Secretary of State.

It is important that this programme office is independent from other industry bodies so that cross-industry buy-in can be harnessed and so that industry can feel that they own both the problem and the solution. The Study received frank and strong feedback on this issue through stakeholder groups, the Study's Project Advisory Board and industry bodies. If the change management programme team (which it is widely accepted is required) is established within an

existing industry organisation, it will not succeed and, more importantly, is likely to be treated with some degree of suspicion and scepticism.

The clear message from industry is to keep this team small, independent, of a high calibre and accountable to the industry as a whole.

The industry has also made it clear that any change management team or office has to be staffed by highly competent individuals who have a variety of skill sets. It has been suggested that, where possible, these people should come from within the industry on a secondment basis and that Train Operating Companies (TOCs), TOC owning groups, Freight Operating Companies (FOCs), NR, suppliers and the Office of Rail Regulation (ORR), to name a few organisations, should be prepared to second some of their best and brightest people to resource the task. Recognising that this is easier said than done, and that the type of person concerned is in short supply, it is recommended that external recruitment and contracting of a few good, graduate-level resources be considered.

In particular it is felt that "change agents", rather than project managers, process managers or administrators, are needed, and these are in relatively short supply in the railway. The individuals needed will require very different skill sets to those generally found within the industry and must be highly motivated to push for and achieve change.

28.3 The pace of change

The Study team believes that this independent programme implementation team should be established by the Department for Transport (DfT) and the ORR as soon as is practicable after this Study's report is published in order to:

- commence a discourse between all stakeholders, initially organising a post-report industry workshop to gauge industry reaction to the report, and to chart a way forward on the adoption of recommendations and delivery;
- help formulate an industry delivery plan covering the recommendations that industry needs to address;
- co-ordinate an effective communications strategy;
- commence detailed implementation planning;
- harness the industry support that currently exists for tackling the industry's cost challenge; and
- ensure that imminent Control Period (CP) and franchise renewal opportunities are not missed due to inaction.

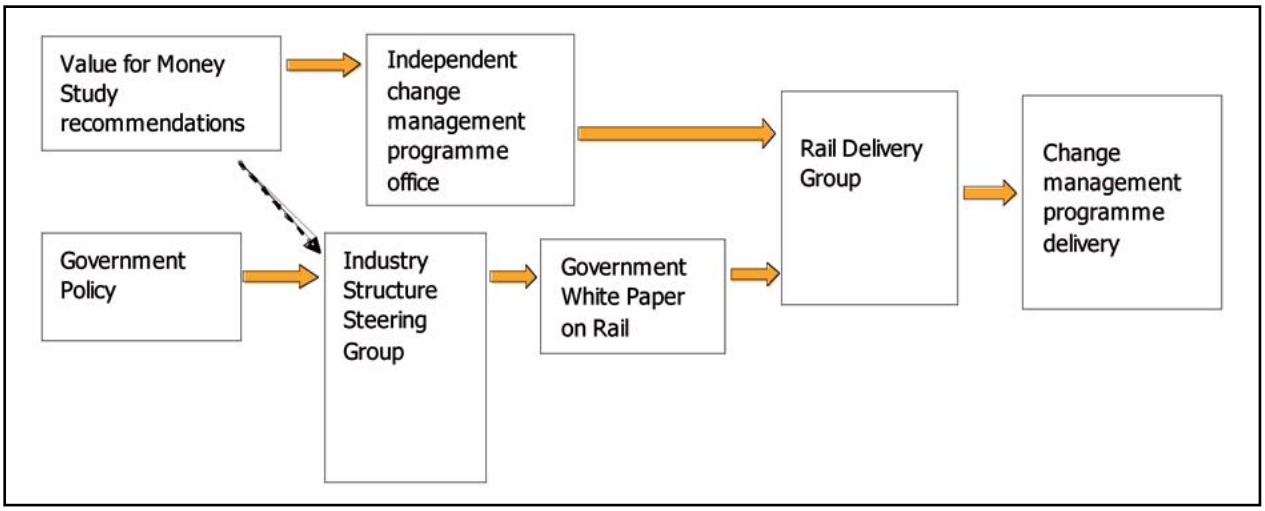
It is also recommended that the RDG (recommended in Section 6.1) is established within 12 weeks of the Study's report's publication, perhaps initially on an informal basis. With the creation of the partnership structure and in line with recommendations in earlier sections of this report, it is recommended that the Rail Safety and Standards Board (RSSB), Technology Strategy Leadership Group (TSLG) and relevant technical and professional functions from the DfT, NR, the ORR and the Association for Train Operating Companies (ATOC) are brought into a newly-established Rail Systems Agency (RSA) without delay. This can take place quickly with the agreement of key stakeholders.

However, it will be for the industry itself, in time, to decide to what degree the RDG and the RSA become responsible for the co-ordination of a wider range of "whole-system" activities and services in preference to NR or other industry bodies.

What is clear is that the early establishment of the RDG and its incorporation of the independent programme implementation team are likely to be critical to establishing a momentum and pace of change that is needed to tackle the industry cost-effectively. In that way the leadership and resources to drive industry reform can be put in place in response to the findings and recommendations of this report, and well before the Government publishes its White Paper on rail industry reform..

Having an RDG/implementation team structure in place before the publication of any White Paper on industry reform in late 2011 would clearly be an excellent start to the change management process, which might have a sequence as shown in Figure 28.1.

Figure 28.1: Possible change management process



28.4 Control Periods and franchise renewals

Franchise renewal points and Control Period commencement will be the key dates at which to drive structural change within TOCs and NR. It is at these contractual and regulatory change points that structural change and other major reforms that affect NR/TOC integration and alignment can be implemented properly. The Study endorses using these change points as important milestones for major structural reform, as they are key opportunities for Government to mandate change and the ORR to monitor progress. Nonetheless, there may be opportunities for early implementation that can be taken outside these change points.

Most importantly, and as an urgent part of the change process, there is a need to ensure that key elements of the Study's findings are specified as part of the upcoming franchise process for West Coast, East Coast and Greater Anglia.

In broad terms, the Study sees:

- CP4 as being a period of industry preparation and restructuring in order to lay the foundations for sustainable cost reduction, although some early wins should be achievable;
- CP5 as being the period of major cost reduction (on a progressive basis);
- the imminent refranchising of West Coast, East Coast and Greater Anglia as major opportunities to drive structural, commercial and cultural change within the industry;

- the refranchising of other TOCs over an extended period as an opportunity to introduce change in a structured and controlled manner – there may also be other opportunities outside of the refranchising process that allow the DfT, NR and TOCs to enact change quicker;
- the current level of current "buy-in" of the industry as a major opportunity that will be lost without immediate and ongoing cost reduction and reform;
- a limited time window to commence implementation of the Study's recommendations on People Change; and
- the change process being a five to seven-year task, with most benefits being realised by 2018/19.

However, the overall timing of change will be very much for the industry to decide and can, with industry drive, be reduced by several years. Many recommendations do not require structural reform and should be pursued by the industry independently. In addition, NR and individual TOCs are free to negotiate immediately bespoke bipartite arrangements that have the potential to produce costs savings/efficiencies in advance of any structural change.

NR's Transformation Programme (NRTP) is already in place to drive out the cost-efficiency savings required by the ORR as part of the CP4 settlement and determination and on into CP5. This programme is initially targeting savings of £3.3bn over the five-year period covered by CP4 and is designed to find 80% of the efficiency savings required by the regulator during this Control Period.

The efficiency savings identified in this report are calculated as over and above those in the Transformation Programme, CP4 commitments and CP5 expectations. However, the Study believes that many of the Study's recommendations, particularly in terms of asset management, supply chain management, programme management and the reduction of industry overhead costs, will have to be adopted before NR can fully achieve these levels of savings from their own programme.

That said, the existence of the Transformation Programme allows NR to action recommendations from this at an early date. It is worth noting that NR has already commenced adoption of many of the structural recommendations in the Study. NR expects the early stages of management devolution to the new Route Managing Directors to happen in the second quarter of 2011, with all routes reorganised by the first quarter of 2012. This gives change management throughout the industry an early momentum and pace of change which needs to be built upon.

28.5 The phasing of change

The eventual change programme will be developed with industry, Government, the ORR and others. For purposes of illustration, the Study team has identified five major phases of change over the next few years. In listing a number of key initiatives (albeit only an outline selection) that are recommended in this report, these phases might be broadly as follows.

28.5.1 Phase 1 (May 2011 to August 2011), post-report

- Establishment of independent programme office/team.
- Informal establishment of the Rail Delivery Group (RDG) by industry on a voluntary basis.
- Incorporation of key findings from the report into West Coast and East Coast franchise specifications, including longer franchises and new incentives regime.
- Launch of ORR's CPS review.

- Commencement of NR route devolution.
- Commence development of Greater Anglia concession/franchise.

28.5.2 Phase 2 (September 2011 to December 2011), Government White Paper

- Formal establishment of RDG.
- Industry plan for CP5.
- Decision on structural option pilots.
- Commencement of selected bipartisan, bespoke partnering arrangements between NR and TOCs where desirable.
- Creation of a National Safety Task Force.

28.5.3 Phase 3 (January 2012 to December 2012), post White Paper

- Publication of High Level Output Specification (HLOS) and Statement of Funds Available (SoFA) for CP5.
- Establishment of the Rail Systems Agency (RSA).
- Commencement of West and East Coast franchises.
- Launch of Rail Innovation and Growth Team.

28.5.4 Phase 4 (January 2013 to March 2014), CP4 residual

- Completion of the first set of annual route profit-and-loss statements within NR.
- ORR CP5 determinations published.
- Two joint ventures or alliances in place by 2013/14;
- Commencement of outsourced "lower-cost regional railway" pilot scheme.
- Completion of NR route devolution.
- The DfT completes analysis of subsidy and its link to rail policy objectives.

28.5.5 Phase 5 (April 2014 to March 2019), CP5

- Adoption of findings into specification for remaining franchise renewals.
- Commencement of a full vertical integration pilot on NR routes by 2014/15, followed by two-year evaluation.
- Commencement of independent operation of one route IM concession by 2014/15;
- Commencement of ORR periodic reviews of franchises.
- Finalisation of fares reform, including revised ORR role in fares regulation.

- Enhancement budget fully devolved to routes/Vertical Integration (VI)/Horizontal Separation (HS) routes.

28.6 The governance of change

The RDG, in addition to being formed as an industry partnership, needs to be governed by a small, but effective, group of senior industry executives at owning group/NR CEO/Board level.

In undertaking the Study, the success of the National Task Force (NTF) governance model has often been raised and it is recommended that a similar arrangement would work well in this case. The NTF was formed some 10 years ago on the orders of the then Secretary of State to co-ordinate industry response to the "meltdown" of industry performance in the wake of the Hatfield accident in 2000. In reacting to the known causal factors of the accident, Railtrack had imposed draconian speed restrictions over many parts of the system and system performance collapsed. The industry was thrown together in crisis and NTF with a small, but professional, secretariat, cross-industry CEO/MD representation, a common cause and chaired by an industry nominee, has very effectively co-ordinated the recovery of system performance on the GB rail system.

This model of governance is clearly applicable to management of the change management task thrown up by recommendations in this report. In examining its appropriateness, and in common with NTF, RDG has a number of common features:

- it does have a similar industry "burning platform" – cost reduction threatens the viability of the GB rail system, much as the catastrophic performance of the system did in 2000/01;
- it needs a cross-industry, whole-system approach to succeed;
- it has to be formed and headed by executives at the very highest level of the industry (it is worth noting that stakeholders commented how NTF had been less effective at times when the seniority of attendees dropped); and
- it has to be accountable to the Secretary of State.

As such, the Study believes that many lessons can be learnt from the success of NTF, and that RDG should adopt a similar methodology and governance to NTF.

28.7 Summary

The implementation of change as a result of the Study will be a matter for Government and the rail industry – in terms of pace, commitment, scope and delivery. The Study's recommendations require some significant steps by the DfT and the ORR, but the primary onus has to be on the industry to plan, manage and deliver change – change which can give passengers and taxpayers the better deal they both deserve, and which can open up major opportunities for GB Rail.

29. Glossary

Alliance	A legally-binding commercial agreement between two or more companies created for a specific purpose and defining how risks, profits and losses are assessed
AMCL	Asset Management Consulting Limited
ASHE	Annual Survey of Hours and Earnings
ASLEF	Amalgamated Society of Locomotive Engineers and Firemen (trade union)
ATOC	Association of Train Operating Companies
ATV	Average transaction value
BAA	A UK airport operator
BCR	Benefit–cost ratio
BCV/SSL	Metronet Rail BCV Limited (BCV) and Metronet Rail SSL Limited (SSL) – responsible under a Public Private Partnership (PPP) agreement for the maintenance and renewal of the Bakerloo, Central, Victoria, and Waterloo & City lines (BCV) and Circle, District, Metropolitan, Hammersmith & City and East London lines (SSL). Entered PPP Administration in July 2007
BIS	Department for Business, Innovation and Skills
BR	British Rail – operator of most of the rail transport in Great Britain from 1948 until privatisation in 1997
BRBR	British Rail Board (Residuary) Ltd – responsible for the remaining functions of the British Railways Board and, in particular, the management and disposal of land and buildings which are surplus to the needs of the operational railway
BSI	British Standards Institute
BSL	The management consultants of the Lloyd's Register Group – dissolved in June 2010
BTP	British Transport Police
BTPA	British Transport Police Authority
C2C	A Train Operating Company (TOC) operated by the National Express Group
CBA	Cost–benefit analysis
CC	Competition Commission
CIS	Customer Information Systems
CLG	Company Limited by Guarantee
CP3	Control Period 3 (2004–09)
CP4	Control Period 4 (2009–14)
CP5	Control Period 5 (2014–19)

CPI	Consumer Prices Index
DBS	DB Schenker Rail (UK) Ltd
DCLG	Department for Communities and Local Government
DDA	Disability Discrimination Act
Devolution	Where responsibility for certain functions is transferred from the centre to more local levels, e.g. NR routes
DfT	Department for Transport
DMU	Diesel Multiple Unit – a train consisting of self-propelled carriages using one or more **integral** diesel engines
DOO	Driver Only Operation
ECML	East Coast Main Line
EFQM	European Foundation for Quality Management
EMU	Electric Multiple Unit – a train consisting of self-propelled carriages using **electricity** as the motive power
ERTMS	European Rail Traffic Management System
EWS	English, Welsh and Scottish Railway – now DB Schenker
FCC	First Capital Connect – a TOC operated by First Group plc
FIM	Financial Indemnity Mechanism
FOC	Freight Operating Company
FRC	Financial Reporting Council
GB rail	All aspects of the rail industry covering England, Scotland and Wales
GMPTE	Greater Manchester Passenger Transport Executive – recently renamed Transport for Greater Manchester (TfGM)
GRIP	Governance for Railway Investment Projects, previously known as Guide to Rail Investment Projects – describes how NR manages and controls projects that enhance or renew the national rail network
HGV	Heavy goods vehicle
HLOS	High Level Output Specification
HLOS2	High Level Output Specification 2 (2014–19)
Horizontal Separation (HS)	Where NR route-level activities are divided into relatively freestanding infrastructure management units.
HS1	High Speed 1
HS2	High Speed 2
HSE	Health and Safety Executive
IEP	InterCity Express Programme – new trains to replace the InterCity 125 fleets on the East Coast Main Line and Great Western Main Line
IM	Infrastructure Manager

INCOSE	International Council on Systems Engineering
Independent ownership	Where one or more infrastructure management concessions come under ownership separate from NR
Interim Submission/ Interim Report	The interim report, published in December 2010, indicating the emerging findings of this Study
IPO	Initial public offering
IPPR	Institute for Public Policy Research
IS	Information systems
ITS	Institute for Transport Studies – an academic department of the University of Leeds
ITSO	Integrated Transport Smartcard Organisation – a Government-backed non-profit organisation which sets common technical standards
IUK	Infrastructure UK – a unit within HM Treasury's Public Services and Growth Directorate
Joint Venture/ Alliance	A legal entity owned by two or more companies created for a specific purpose and to share the resultant profits and losess
JPIP	Joint Performance Improvement Plan – a regulated agreement between Network Rail (NR) and a TOC to improve performance
KPI	Key Performance Indicator
LC7	Licence Condition 7
LEK	L.E.K. Consulting
LNE	London North Eastern
LNW	London North Western
LSE	London and South East
LUL	London Underground Limited
MOD	Ministry of Defence
MSB	Mode Shift Benefit
NAO	National Audit Office
NATA	New Approach to Appraisal – A Government framework used to appraise transport projects and proposals in the UK
NATS	NATS Ltd – a company providing air traffic control services for aircraft flying in UK airspace and the eastern part of the North Atlantic
NDS	National Delivery Service
NNTR	National Notified Technical Rules
NR	Network Rail
NRDF	Network Rail Discretionary Fund

NRTP	Network Rail Transformation Programme
NSARE	National Skills Academy for Railway Engineering
NSIP	National Stations Improvement Programmes
NTF	National Task Force – a cross-industry body with senior representatives from passenger and freight train operators, NR, ATOC, the DfT and the ORR. Its primary focus is train service delivery
OAO	Open Access Operator
OFT	Office of Fair Trading
OM&R	Operation, Maintenance and Renewals
OPPPA	Office of the PPP Arbiter
OPRAF	Office of Passenger Rail Franchising
ORR	Office of Rail Regulation
PALADIN	Performance And Loading Analysis Database Information
PAS 55	Specification published by the British Standards Institution
PDFH	Passenger Demand Forecasting Handbook
PM10	An emissions measurement of a complex mixture of soot, organic and inorganic materials, having a particle size less than or equal to 10 microns diameter
PPM	Public Performance Measure – assesses operational performance
PPP	Public Private Partnership – a specific type of Private Finance Initiative (PFI)
PRM	Persons with restricted mobility
PTE	Passenger Transport Executive
PWC	PricewaterhouseCoopers – a consulting company
RAB	Regulatory Asset Base
RAIB	Rail Accident Investigation Branch – the independent railway accident investigation organisation for the UK
RDG	Rail Delivery Group
RFF	Réseau Ferré de France – the IM for the French rail network
RFG	Rail Freight Group
RFOA	Rail Freight Operators' Association
RIGT	Rail Innovation and Growth Team
RGS	Railway Group Standards
RIA	Railway Industry Association – the representative body for UK-based suppliers of equipment and services to the industry
RM3	Railway Management Maturity Model
RMT	The National Union of Rail, Maritime and Transport Workers
ROGS	Railway and Other Guided Transport Systems (Safety) Regulations 2006

ROSCO	Rolling Stock Company – own, lease and, in some cases, maintain rail vehicles
RPI	Retail Prices Index
RPS	Railway Pension Scheme
RSA	Rail Systems Agency
RSSB	Railway Safety and Standards Board
RTRI	Railway Technical Research Institute
RUOE	Real Unit Operating cost Expenditure
RUS	Route Utilisation Strategy
S&C	Switches and Crossings
SBB	Swiss Federal Railways
Scoping Report	The Scoping Report of the Study, published in June 2010
SDG	Steer Davies Gleave – a consulting company
SFN	Strategic Freight Network
SNCF	Société nationale des chemins de fer français – French national train operator
SoFA	Statement of Funds Available
SRA	Strategic Rail Authority – in existence from 2001–06
TfL	Transport for London
TGV	Train à Grande Vitesse – France's high-speed train
TIC	Technology Innovation Centre
TOC	Train Operating Company
TOPS	Total Operations Processing System – a computerised system for the management of train and vehicle movement
TPE	TransPennine Express – a franchise operated by First Group plc
TRL	Technical Readiness Level
TRUST	Train Running System – a computer system that monitors operational performance and delays
TSA	Ticketing and Settlement Agreement
TSAG	Technology Strategy Advisory Group (now TSLG)
TSB	Technology Strategy Board
TSI	European Technical Standards for Interoperability
TSLG	Technology Strategy Leadership Group
TSSA	Transport Salaried Staffs Association – a trade union
TVM	Ticket vending machine

UIC-LICB	UIC – Union Internationale des Chemins de Fer (International Union of Railways); LICB – Lasting Infrastructure Cost Benchmarking A working group/programme concentrating on top-down cost benchmarking of maintenance and renewals processes across UIC members (including NR, but excluding, at the moment, HS1)
Unite	British and Irish trade union, formed on 1 May 2007, by the merger of Amicus and the Transport and General Workers' Union
VfM	Value for money
Vertical Integration (VI)	Where two or more separate firms combine in one integrated unit their previously-separate activities – in this case combining route infrastructure management and train operations wthin a single, long-term concession held by one company
WCML	West Coast Main Line
WIT	Waterloo International Terminal