



Office of Rail Regulation

Rapid review of Network Rail's capability to deliver its increased programme of enhancements

April 2008

Office of Rail Regulation

Review of Network Rail's Capability to Deliver its Enhancement Programme

Final v1

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Executive Summary

On behalf of the Office of Rail Regulation (ORR), the Nichols Group has carried out a rapid review of Network Rail's capability to deliver its substantially increased enhancements programme planned for Control Period 4 (April 2009 – March 2014). This report gives the findings and recommendations resulting from the review.

Definition of “capability”

“Capability” is interpreted in this context to mean Network Rail's ability to deliver successfully its planned enhancements within the constraints it faces. Hence, in addition to the quantum and competence of its resources, this involves considering a complex set of other factors. These include: scale and complexity of requirements; structure and effectiveness of organisation; methods, processes and systems used; interdependencies with other work streams, projects and activities; capacity and capability of supply chain; contributions and expectations of various stakeholders; competition for resources from external projects and programmes; and constraints, such as timing, funding and extent of access to the railway.

Significant challenge

We consider that the planned enhancements programme does present a significant challenge to Network Rail (NR) and the rail industry as a whole, although some of those with whom we spoke tend to play this down.

The degree of challenge is demonstrated by:

- increase in volume: from £4.35bn in CP3 to £11.1bn for CP4 (although this would appear to be offset to some extent by a reduction in renewals expenditure - mainly because of improved efficiency - from £14.2bn to £11.3bn)
- step change in rate of spend (from £1bn in 2007/8 and £1.4bn in 2008/9 to £2.7bn in 2009/10 and a peak of £2.8bn in 2010/11)
- enhancement projects being generally much more complex and demanding than renewals – larger schemes (95% by value > £10m), more interdependent and multidisciplinary (whereas renewals tend to use mainly a single type of resource)
- many schemes needing external approvals and planning consents
- multiple funding clients with whom NR must deal (although DfT represents almost 80% of the value)

- significant dependence on actions of other parties – e.g. rolling stock being procured by the DfT.

Uncertainties in programme

A large proportion of the enhancement projects are at a very early stage of development, having not yet completed GRIP stage 2. Hence they do not have a robust definition of scope or reliable estimates. Very few have reached GRIP stage 4, when there is a reasonably sound implementation plan and cost estimate, although still not market tested.

Consequently, there is considerable uncertainty about the resource requirements, costs and timing for the vast majority of these projects; and some of their business cases may not be viable.

Furthermore, in CP3 development was typically slower than expected, although it has been getting quicker. Even at the present improved rate, it could take around a further three years for the majority of projects to reach stage 4.

Industry structure

The organisational structure of the industry is complicated, especially when dealing with enhancements, by the number of different parties involved: DfT, Transport Scotland, ORR, Network Rail, TOCs and FOCs, the supply chain, and others.

The HLOS approach to requirements definition is a major step forward, although in its first application. Also the various parties involved appear to have collaborated well in developing the SBP. However, there are risks of difficulties ahead in dealing with any changes of requirements or underperformance, because of separation between:

- client roles defining requirements and providing funding (DfT, Transport Scotland, and other funders) and agreement of appropriate level of funding and monitoring performance against plan (ORR)
- procurement of rolling stock and delivery of infrastructure.

Obviously, to achieve successful outcomes, close collaboration will need to be maintained between the various parties involved.

Concerns

Shortfalls of delivery in CP3

Some renewals work – mainly involving electrification, signalling and property – has tended to be deferred from CP3 to CP4. Although there has been generally successful delivery of the two largest enhancement projects in CP3 (WCML and Southern Region New Trains) other smaller enhancements have been relatively slow to develop and deliver in CP3, due particularly to delays caused by external inputs, although this has been improving.

Activity increases in CP4

Latest activity forecasts show significant increases in some activities – especially property (up five fold), OLE (doubling), and switch and crossing units (up 68%). Thus the planned growth rates in 2009/10 – particularly for property, power distribution and OLE activities – appear unrealistic. These forecasts have also changed significantly in some cases since October 2007, confirming that the forecasts are not yet stable. Furthermore, these forecasts omit some programmes not yet well developed, which could amount to a further £1bn of enhancement activity.

Safety

Obviously, more work means more people are exposed to risk during construction. However, we see no reason to doubt that effective management can maintain a safe railway and achieve HLOS safety targets.

Omissions from forecast requirements

The potential additional activity to achieve significant performance improvements targeted in the HLOS and the 7 Day Railway is included in the financial plans but not yet in the activity forecasts. Also, internal productivity assumptions appear ambitious, especially in enhancements delivery, and for engineering, planning and supply chain disciplines. Hence, forecasts of internal resource requirements seem substantially to underestimate the likely demand.

Engineering access

Increase in volumes envisaged in SBP will inevitably require more engineering access to the busiest parts of the network. This will tend to extend planning and construction timescales. Various efficiency measures are being taken to reduce the time required for individual possessions. However, their success is not yet demonstrated and they are unlikely to have much effect until the later years of CP4.

The requirements to achieve the contemplated 7 Day Railway are not yet clear, but could place substantial further demand on track, signalling and overhead line resources.

Efficiency targets

We also understand efficiency targets may be set as part of the Access Charges Review. That is outside the scope of this review. However, we would note that whilst efficiency gains can release resources and funds for other projects, demanding efficiency targets for enhancements would consume management time and attention for NR and its suppliers, and hence increase the challenge presented by the programme.

Resource shortages

NR needs more commercial, project and programme managers and additional specialist railway engineering skills in order to deliver the enlarged enhancements programme. It aims to get these partly by recruitment, partly from agencies, and partly by developing existing staff. This will mean recruiting over the next year at approaching twice the rate it has achieved in the last year. Attracting and retaining the required people is likely to become even more difficult because of the unprecedented number of other large railway and infrastructure projects in the UK and abroad which are competing for the same scarce resources.

Supply chain

As the supply chain will need to supply around 90% of the required resources, its capability and response will be of crucial importance for success of the programme.

Organisational capability and competence

NR began measuring its organisation capability and competence in Summer 2006 by means of a self-assessed Capability Maturity Model (CMM). The score for the Enhancement directorate was initially 3.75 and had risen to 3.8 by October 2007. Larger enhancements generally require a higher level of capability and NR has targeted a score of 4.15 for the Enhancements programme by June 2008. That is far in excess of what was achieved over the previous 15 months and it is not clear that there is a concerted plan to develop this enhanced capability.

Lessons from New Year overruns

Recent overruns of possessions over the New Year have raised questions about NR's ability to manage its enhancements programme. In particular, ORR's investigation drew attention to the variable quality of NR's project management – particularly, planning and risk management. Clearly, the ORR will want to be satisfied that the lessons have been learned and appropriate corrective measures taken.

Positive indications

There are a number of reasons for believing that, given time, NR can rise to the challenge of the increased enhancements programme, including:

- it has carried out the large volume of renewals in CP3 generally to budget, whilst achieving targeted efficiency improvements of almost 30%
- its two major enhancement programmes – Southern Region New Trains and West Coast Main Line – were delivered essentially to time
- the vast majority of engineering possessions were completed without unplanned disruption to services.

Furthermore, in order to deal with its increased enhancements programme, NR has launched a number of initiatives to:

- increase staffing levels and competence
- incorporate matrix management principles into its Infrastructure Investment organisation
- enhance its overall effectiveness
- increase efficiency
- work with RIA and other organisations to improve competence and skills in its supply chain.

However, it is not yet evident that NR has established a concerted change programme focused on delivering a prioritised set of the specific capability improvements needed to meet the enhancements challenge in CP4.

Recommendations

A number of specific recommendations are made in Section 9. However, our first concern is to ensure that all parties concerned recognise that:

- the planned enhancements programme is a major challenge
- significant and urgent actions need to be taken to meet it
- even then there is serious risk that all expected outcomes will not be achieved within CP4.

So the crucial issue is to determine what can be done to maximise the likelihood of success; and then do it in a determined, coordinated and timely way.

NR has achieved a great deal in increasing Government and public confidence in its capability to perform its operating, maintenance and renewals activities competently. In the limited number of enhancement works it has carried out to date, it has generally performed well on its two biggest, high profile projects, but less well on its other enhancements.

It has launched a number of initiatives to improve its capability. Nevertheless, the evidence so far is that it has not yet gone far enough or is progressing sufficiently quickly to be confident of delivering the enhancements programme successfully within the timing, funding and other constraints it faces.

This suggests that the planned timing of the programme should be rephased to smooth out, as far as practicable, the requirement for scarce resources over CP4. It may also require the deferral of some enhancements into CP5, with consequent impact on the HLOS outcomes.

However, our main recommendation is that all the initiatives are prioritised and then brought together within a single change programme specifically focused on the capabilities needed for the planned enhancements. Ideally that programme should include the contributions of the other key parties in delivering the programme. Without compromising the other players' respective roles, this gives NR the opportunity to exercise real leadership across the UK main-line rail industry.

1. Introduction

In response to an invitation from the Office of Rail Regulation (ORR), the Nichols Group has conducted a rapid review of Network Rail's capability to deliver the substantially increased programme of enhancements in the five years April 2009 to March 2014. The enhancements form part of the Strategic Business Plan for Control Period 4 (CP4).

In view of the short time and limited budget for this assignment, this has inevitably been a very limited review. The findings and recommendations are set out in this report.

1.1 Terms of reference

The full terms of reference are included as Appendix 1, but the scope is defined as to carry out a rapid review to:

1. Consider the Strategic Business Plan and supporting information on its deliverability provided by NR
2. Comment on NR's capability to deliver the enhancements programme
3. Propose the scope and terms of reference for a more comprehensive review of NR's capability, if that is thought necessary. We have since agreed with ORR that this was not appropriate within this report.

1.2 Review team

For this assignment, we deployed three of our most senior consultants:

Mike Nichols	Chairman & Chief Executive
Peter Hansford	Executive Director
Paul Wiseman	Senior Consultant

Brief outlines of the qualifications and experience of each are given in Appendix 2.

1.3 Approach adopted

Within the very limited time and resources available, when key executives in Network Rail are concentrating on refreshing and validating their business plan whilst ensuring effective completion of engineering works over the Easter holidays, we decided to avoid undue intrusion by:

- conducting the minimum number of interviews – one each of the ORR, Department for Transport, Transport Scotland, Rail Industry Association (to get the perspective of Network Rail's supply chain) and ATOC (for views of the train operating companies); and just two interviews of senior managers of Network Rail. The people interviewed are listed in Appendix 3
- relying, as far as possible, on a perusal of documents already supplied by Network Rail to the ORR
- trying to minimise our requests for additional information to be produced specifically for our study.

Nevertheless, we believe we have gained sufficient insights to draw some tentative findings and make recommendations. Obviously, a more comprehensive review would support firmer findings and more substantive proposals.

This review was conducted in advance of the Network Rail April 2008 SBP refresh using the information available at the time. It does however reflect the anticipated changes in the enhancement programme as advised by Network Rail during the review, although we have not been able to confirm consistency with the April refresh.

1.4 Acknowledgements

We wish to thank the representatives of the ORR, Department for Transport, Transport Scotland, Network Rail, ATOC and RIA whom we met in conducting this review for their positive responses and helpful co-operation and support throughout.

2. Capability

2.1 Meaning

“Capability” can be defined as the ability to achieve specified objectives within the actual constraints. Increasing capability enhances the probability and therefore confidence in successful achievement of the objectives.

In this review we are focusing on Network Rail's capability to deliver successfully the enhancements included in its Strategic Business Plan within Control Period 4 (CP4).

Several other words are often used as if they were synonymous with “capability” – notably, “capacity” and “deliverability”. However, we would interpret them differently:

- “Capacity” the extent to which an organisation has the resources and competence to undertake a project or programme, but does not necessarily imply that it will do so successfully within the applicable constraints
- “Deliverability” the degree to which it is feasible to carry out a defined project or programme within defined funding, timing and other constraints, irrespective of the capability of a specific deliverer. Of course, if there is only one possible delivery organisation, this is equivalent to capability.

2.2 Factors involved

Capability depends on much more than simply the quantum and quality of resources. It is the result of a complex combination of several factors, which include:

- **Requirements** – clarity of what is to be delivered; its scale and complexity; future changes in scope; and the extent of “overhangs” – i.e. the additional work resulting from delays or deferrals from CP3; and preparatory development work for CP5
- **Organisation** – the strength and competence of leadership; and the structure, culture and effectiveness of the organisation
- **Resources** – the adequacy, competence and motivation of the people available to carry out the work; and the supply of materials and plant required
- **Methodology** – the methods, processes and systems deployed
- **Interdependencies** – including other major work streams (especially renewals and maintenance); between projects (where they interact or compete for access or other

scarce resources); and activities carried out by other parties (e.g. rolling stock procurement by the DfT)

- **Constraints** – notably, timing, funding and extent of access to the railway
- **Supply chain** – the capacity and capability of the supply chain; and market conditions
- **Competition from external projects and programmes** – especially for funding and resources
- **Stakeholders** – the influence of their contributions and expectations
- **Uncertainty, risks and opportunities** – which relate to all of the above.

We refer to each of these factors in the sections below.

3. Network Rail's enhancement programme

The key questions we consider in this section are: what is Network Rail expecting to deliver and how clearly is it currently defined? We will make reference below primarily to the enhancement programme, but place it in relation to changes in maintenance and renewals activities with which it competes for the same resources.

3.1 Definition of enhancements and renewals

Investment activity is categorised as either renewals or enhancement. This is primarily a mechanism to distinguish sources of funding, but it refers to the impact the work will have on network outputs. Renewal involves asset replacement to sustain existing network outputs. Enhancement is required to create increased network capability and hence generate additional outputs.

The physical nature of renewals and enhancement works are not necessarily any different; they may involve replacement of assets and hence very similar design and installation activities. However a number of additional activities are required for enhancements, including for instance development work to demonstrate that the desired outputs can be efficiently achieved, and the securing of external approvals to undertake change. They are also typically characterised by being multi-disciplinary, whereas renewals are generally undertaken by single engineering disciplines. These features can lead to additional complexity, the implications of which are considered later in this report.

3.2 Maintenance

Network maintenance entails the day to day inspection, repair, and routine planned and preventative interventions which sustain the condition and performance of assets. The boundary between maintenance and renewals can be somewhat arbitrary: for instance, the civil renewal budget covers most routine and preventative maintenance activity.

Network Rail expects its maintenance activity to continue at much the same level in CP4 as for CP3. However it also plans various efficiency initiatives which will reduce the resource demands and the costs of undertaking it.

Having in-sourced much of the management and delivery of maintenance early in CP3, the resources needed to deliver the maintenance activity are generally separate from supplier resources delivering renewals and enhancements. However, the productivity benefits arising from the maintenance efficiency initiatives will potentially free up a certain amount of this

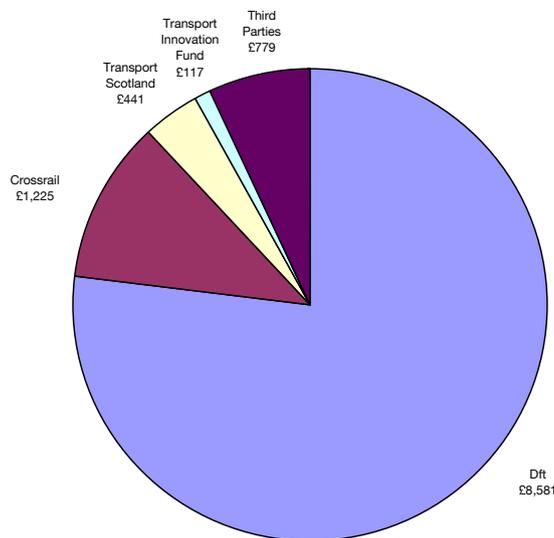
delivery resource, and it is Network Rail’s intention to deploy some of this resource on appropriate renewals activity. In general it is unlikely that this resource will have much impact upon enhancement delivery, as the nature of that work is less suited to the skill sets available in the maintenance resource pools. Maintenance activity is currently managed and resourced separately from the project organisation, and Network Rail has no plan to change this.

3.3 Funders’ requirements for enhancement

Network Rail is responding in its Strategic Business Plan to the needs of various funders of infrastructure works. These include DfT, Transport Scotland, Train Operating Companies and Freight Operating Companies, Passenger Transport Executives (PTEs) and various other external parties. The SBP identified £9.6bn of enhancement funding in CP4. Since then Network Rail has agreed to take on the delivery of elements of Crossrail, valued at £1.2bn in CP4, and has proposed various other changes/additions to its enhancement plan. We understand that the total enhancement activity now identified within the April 2008 SBP refresh is £11.14bn.

The split of works by funder and the relative sizes of the elements of enhancement expenditure proposed in the April SBP refresh are shown in Figure 1 below.

Breakdown of CP4 Enhancement by Funder (£11,143m)



Funder	£m
DfT	£8,581
Crossrail	£1,225
Transport Scotland	£441
Transport Innovation Fund	£117
Third Parties	£779
Total	£11,143

Figure 1: CP4 enhancement expenditure by funder

It can be seen that works funded by the DfT dominate the enhancement programme. The major elements or sub-programmes of DfT funded activity are summarised below.

Crossrail relates to the delivery of those elements of this major project which are on Network Rail's assets and therefore their responsibility. We note that this is a provisional estimate for this project, and that there is not yet a committed schedule for delivery.

Transport Scotland projects include Airdrie to Bathgate and Glasgow Airport Rail Link, as well as a number of smaller tier 2 projects, and potential development of tier 3 projects for delivery in CP5.

Transport Innovation Fund includes primarily freight strategic network enhancements, including Gospel Oak to Barking, Southampton to West Coast and Peterborough to Nuneaton gauge clearance projects, Olive Mount chord and access to the Humber ports.

Projects for third parties include a diverse range of projects for other funders, including TOCs, PTEs, local authorities and private parties. Some of these are well developed, and others are at an early stage.

DfT Funded Programmes	SBP Value £m	Current value (refresh) £m
	(06/7 prices)	
Baseline projects incl. Access for All	1,221	1,251
Thameslink	2,589	2,700
Specified projects, incl. IEP, NSIP NRDF, Reading and Birmingham New Street	1,446	1,441
Development for CP5	240	240
HLOS capacity & performance	1,480	1,784
Optional projects	696	594
7 Day Railway	270	320
Additional performance	400	250
Total:	8,342	8,580

Table 1: Enhancements breakdown by programme

DfT funded enhancement breakdown (£8,580m)

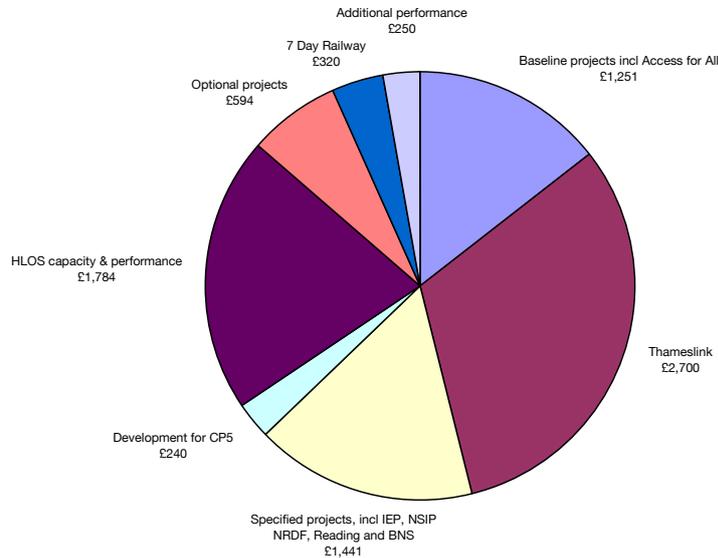


Figure 2: DfT funded enhancement breakdown

3.4 Scale of enhancement activity

During CP3, Network Rail forecasts that it will have delivered £14.2bn of renewals and £4.35bn of enhancement at 2006/7 prices. During CP4, the scale of enhancement activity increases substantially to £11.1bn and will be comparable with the level of renewals activity, as illustrated in Figure 3 below.

The profile shows rapid growth in enhancement activity, rising from a level of circa £1bn in 2007/8 to a peak of £2.8bn by 2010/11, raising challenges in terms of the required pace of development, and resourcing of delivery, which we will return to in Section 5.

Renewal & Enhancement Expenditure Trend

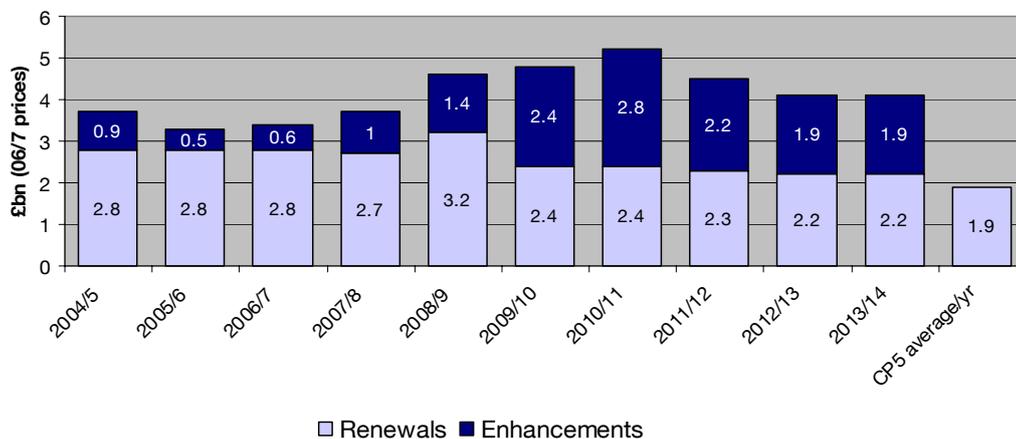


Figure 3: Renewals and enhancement spend

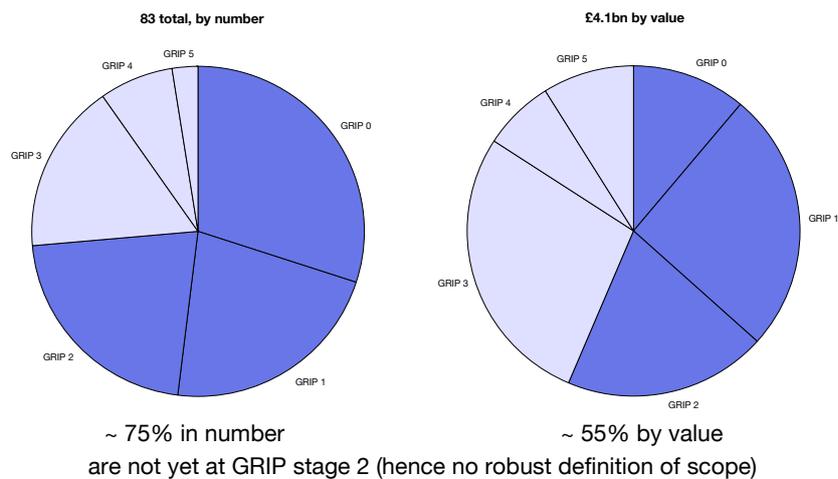
Sources: October 2007 SBP, April 2008 SBP refresh; NB no meaningful forecast available for CP5 enhancement

3.5 Stage of development

The various programmes listed above have differing challenges of definition and output uncertainty. A key indicator of the extent to which the enhancement challenge is understood is the development level of the various projects. Development level is measured in terms of GRIP status and was reported in the SBP (page 141). Network Rail has recently supplied a more up to date set of development status data as at March 2008, which we refer to below.

The development levels of the SBP enhancement portfolio are shown by number of projects and value in Figure 4 below. In these charts we have chosen to exclude Crossrail (which is still at a relatively early stage in development) and Thameslink (which is understood to be at GRIP stage 5) as these large projects would otherwise dominate the picture. We have also excluded several of the programmes of smaller enhancements, e.g. Access for All, NSIP and NRDF, as the detailed development status was not available. The charts below therefore cover: HLOS capacity and performance, specified projects, TIF and Network Rail’s proposed “optional projects”, representing just under half of the DfT and Transport Scotland funding.

Early stage of development



Very few projects well developed

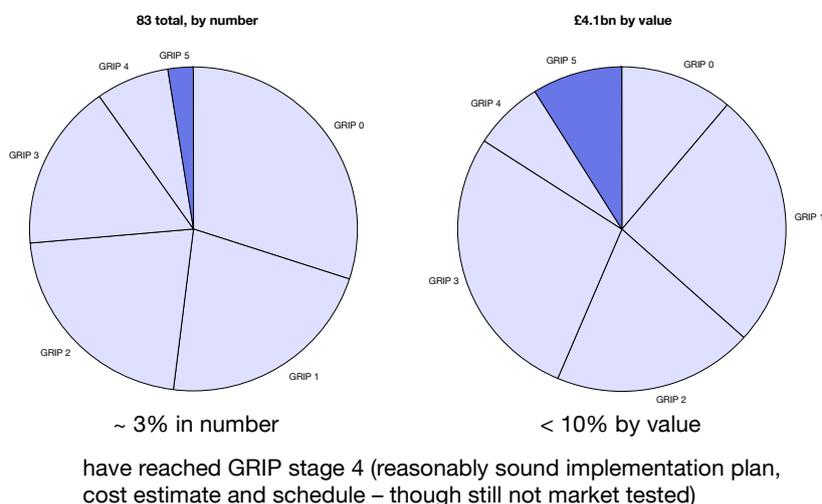


Figure 4: Development level by number and value of projects

In some respects the current development level of the remaining programmes is less of an issue, as these are funds from which flexibility to allocate funding to specific projects during CP4 is expected. The Access For All and National Stations Improvement (NSIP) programmes have a provisional list of target stations to be addressed, and some locations are well developed. The Network Rail Discretionary Fund (NRDF) programme also has a preliminary list of individual schemes, some of which are well developed, and others at initial proposal stage. The additional performance programme and Network Rail's proposed expenditure on 7 Day Railway are as yet not defined at the level of specific investments (effectively GRIP 0) and this creates major uncertainty in relation to the likely nature and timing of required activity.

Were we to include all of the above major projects and programmes within our GRIP level analysis, with the exception of Thameslink we believe that the picture would remain broadly as in the Figures above for the specific projects.

3.6 Uncertainty associated with development levels

As projects are developed, they become progressively more certain, as key information and assumptions are determined. However at early stages considerable uncertainty remains. Figure 5 overleaf provides our interpretation of the key uncertainties at each development stage. This refers to the uncertainties still remaining once this stage is completed.

	unreliable			Reasonably reliable		Market tested
GRIP Level	2	3	4	5	6	7 & 8
Stage name	Pre-feasibility	Option selection	Single option development	Detailed design	Construction, testing and commissioning	Project handover and closeout
Key outputs	Functional specification and high level option assessment	Project design specification and option selection report	Reference design and implementation plan	Detailed design	Built and commissioned project	Project handed back into service - project closed
Residual uncertainties	<ul style="list-style-type: none"> Potential for additional scope until outputs modelled Land and acquisition costs Access strategy and compensation Potential need for public enquiry Environmental impact mitigation Market price and unforeseen contractors risks Detailed design and temporary works sequence Planning consents Industry change approvals Contractors final construction plan Final inflation costs Risks emerging during construction Maintainability and operability Output and benefits realisation 	<ul style="list-style-type: none"> Environmental impact mitigation Market price and unforeseen contractors risks Detailed design and temporary works Planning consents Industry change approvals Contractors final construction plan Final inflation costs Risks emerging during construction Maintainability and operability Output and benefits realisation 	<ul style="list-style-type: none"> Market price and unforeseen contractors risks Detailed design and temporary works Planning consents Industry change approvals Contractors final construction plan Final inflation costs Risks emerging during construction Maintainability and operability Output and benefits realisation 	<ul style="list-style-type: none"> Contractors final construction schedule Final inflation costs Risks emerging during construction Maintainability and operability Output and benefits realisation 	<ul style="list-style-type: none"> Maintainability and operability Output and benefits realisation 	<ul style="list-style-type: none"> Output and benefits realisation

Figure 5: GRIP development levels and associated uncertainty

As indicated, GRIP stage 2 is a key point in the development of schemes, in that up to this point there is not a robust scope for the project and therefore any business case is speculative. Whilst activity volumes, estimates and schedules may be generated they are likely to be subject to significant uncertainty and change.

GRIP stage 4 is a further key development step, as this is the point at which there is a robust implementation plan associated with the preferred option. Although the estimate will not have been market tested, cost forecast and delivery schedule will be far more secure from this point onwards.

As can be seen from this development level analysis, nearly 75% of the HLOS projects representing 55% by value had not yet reached GRIP stage 2 at March 2008. As such it should be recognised that there is still considerable uncertainty as to whether individual projects have a viable business case. Activity volumes, cost estimates and schedules are also relatively uncertain for a considerable proportion of the portfolio.

As Network Rail has a significant portfolio of projects there is some opportunity to manage this uncertainty in terms of the overall volumes of work required; shortfalls in one project may be absorbed by increases or acceleration in others. However, whilst this may act as a buffer in terms of volumes, it is unlikely that the overall plan will hold to schedule, as acceleration is less common than delay and resources cannot always be switched from one project to another.

3.7 Schedules

Network Rail has published a series of high level schedules in support of the SBP HLOS schemes.¹ These provide indicative timescales for each GRIP stage of each project. In the time available for this review it has not been possible to review the specific schedules to determine whether these are robust; however an overall assessment of the proposed timescales has been undertaken as presented below.

One factor which might be likely to influence the schedule duration is the scale or value of each project. Figure 6 below presents the durations of each GRIP stage or group of stages as identified in the Network Rail schedules against the project value. This Figure illustrates that there is little apparent correlation between the proposed schedules and the project value. In each case we have given an indicative range of durations (shown by the ovals in Figure 6 overleaf) which might be expected to apply for typical enhancement projects, based upon our experience. This suggests that around a quarter of the projects currently have optimistic schedules and perhaps a quarter appear fairly pessimistic, although there may be particular circumstances requiring extended durations for these projects.

¹ HLOS Projects CP4 Schedules, Network Rail, March 2008

Schedules by stage

Little apparent reflection of scale/complexity
Inadequate allowance for external approvals

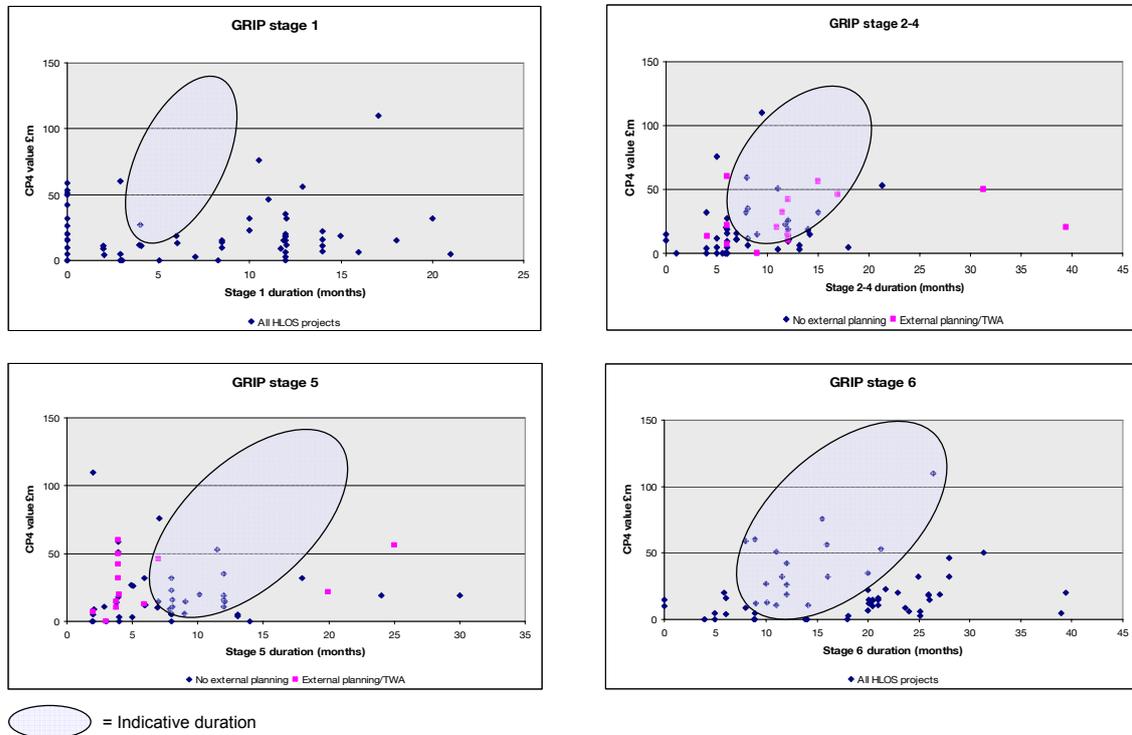


Figure 6: Schedules by GRIP stages

A further factor likely to influence the required development timescales is the need to secure external planning approvals. Three types of approvals are likely to be required. The first are industry approvals for Network, Station and Depot change. Almost all of the enhancement schemes are likely to require this; it will typically add three months to the duration of stage 2-4, assuming that approval is secured readily.

The second type of approval is external planning approval; this will typically take an additional six months, usually at the start of GRIP stage 5. The final type is Transport and Works Act approval which can take six to 18 months depending upon scheme complexity, again typically at the start of GRIP stage 5. Network Rail had indicated in the October SBP that only eight projects should require either TWA or external planning approval, but Steer Davies Gleave and Ove Arup² have identified that this is likely to be required for a further 14 HLOS schemes. Figure 6 highlights those schemes which SDG/Ove Arup have identified as being likely to require this external approval; it can be seen that in some cases inadequate time appears to have been allowed for this process.

Network Rail has recently provided an updated view, which recognises that in the LNE, LNW and Scotland Territories as many as 25 HLOS schemes may require external planning approval, including 12 requiring TWA. Of these, around a half have not made any allowance for this activity within their schedules. NR has not yet completed this assessment for the

² SDG and Over Arup reports, Dec 07 and Feb 08.

Southern and Western Territory projects. **This planning approval activity will inevitably introduce slippage into some of the proposed plans.**

One of the reasons why enhancement projects are typically subject to greater uncertainty in development duration and indeed to longer timescales overall, is the extent to which the development process is at times subject to factors outside of Network Rail's control. In addition to the securing of external approvals as noted above, other factors include changes in external funder project requirements and the need to integrate enhancement projects with other Network changes such as the introduction of new rolling stock. This is a very common feature of many of the HLOS projects. This issue will be explored at greater length below.

We note that the rate of development progress for the HLOS projects has been reviewed by SDG in their recent assessment. This indicates that between July 2006 and September 2007 the overall rate of progress was very limited; around a quarter of the schemes had advanced by one or more development levels, but this was offset by around a third of the schemes actually reducing in development level. Although this may well have been due to factors outside of Network Rail's control, it illustrates the practical difficulty in ensuring steady and predictable development. **Until projects reach development level 4, it is not uncommon for schemes to regress as unforeseen factors require repetition of earlier stages.**

More recently development progress has been much improved, and between September 2007 and March 2008, around 35 projects progressed by one or more stages, and only four projects regressed. Overall the development level improved by an average of a half a stage across the portfolio. **This is very encouraging progress but, if this rate of development progress were to be maintained, it would still take around three more years for the majority of the projects to reach the end of stage 4.** Of course this is a simplistic assessment, and in the time available for this review it has not been possible to conduct a detailed schedule review at individual project level which would be necessary to fully assess schedule confidence.

The SDG/Arup reviews also considered the movements in project cost estimates which had occurred between July 2006 and October 2007. Although the net cost forecast for those HLOS projects originally identified had only increased by a small percentage, the estimates for individual schemes had been subject to some very considerable increases and decreases. Overall the gross cost movements were around £1.8bn on a spot estimate of circa £2.8bn. **This illustrates that projects at an early development stage cannot necessarily be assumed to be stable in terms of scope and estimate, and hence viable in terms of business case.**

Network Rail has advised that it has undertaken some schedule risk analysis for those schemes which are more advanced in development. We have not reviewed this in detail, but we recognise that it will have helped to provide a margin of contingency in relation to the development schedules for these schemes.

In summary therefore, whilst it is clear what outcomes are required and it will shortly be clear what funding is available, there remains considerable uncertainty regarding the exact projects, scope, and hence the cost, time, activities and resources that will be required to meet these outcomes.

4. Organisational context

The respective roles of the principal parties are set out in the 2004 Rail White Paper and the Railways Act 2005. In this section we describe the roles, in relation to the enhancement programme, of:

- Department for Transport
- Transport Scotland
- Network Rail
- Office of Rail Regulation
- Passenger Train Operators and Freight Operators
- rail supply industry
- passengers and freight customers.

We illustrate the principal relationships between these parties in Figure 7 below.

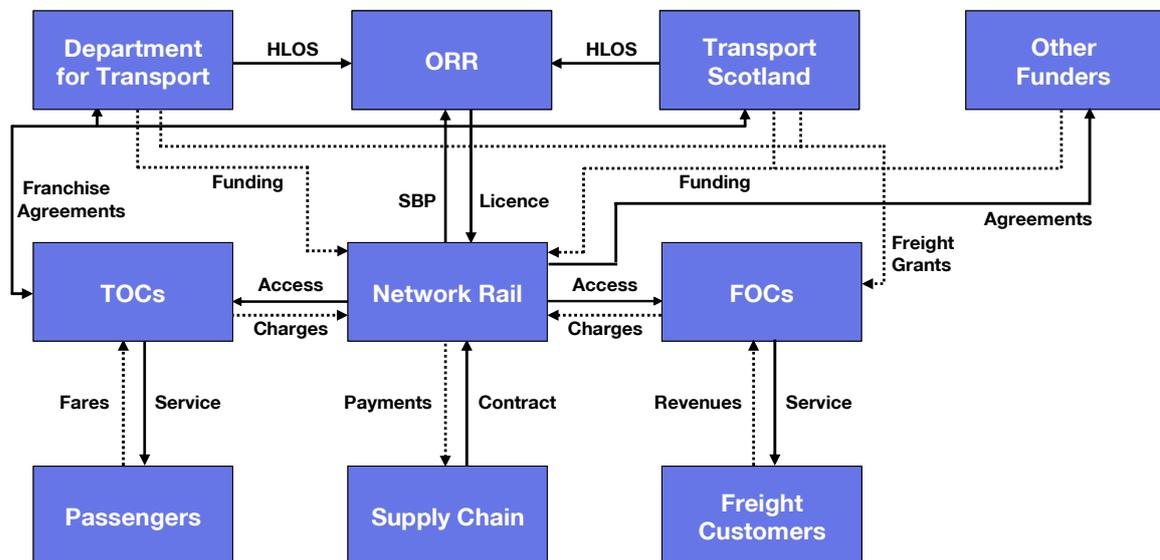


Figure 7: Relationships between parties

4.1 Department for Transport

The Department for Transport (DfT) is the Government funder for the majority of rail enhancements in England and Wales.

The DfT has stated its requirements for CP4 in its High Level Output Specification (HLOS) and Statement of Funds Available (SOFA). The DfT HLOS has set outputs for safety, reliability and capacity, in addition to requiring delivery of a number of specified enhancement schemes:

- Thameslink
- Birmingham New Street
- Reading Station
- Intercity Express Programme (IEP)
- National Stations Improvement Programme (NSIP), and
- strategic freight network.

The DfT, through its Projects Group, is the Government client for the bulk of the enhancement programme. It plays an active client role with respect to the major projects (Thameslink, Birmingham New Street, Reading Station and IEP) and a less active client role for smaller HLOS schemes.

The White Paper requires that the Secretary of State is kept informed of progress towards meeting the specified outputs, by means of a 'Reporting Requirement', agreed between DfT, ORR and Network Rail. The White Paper makes it clear however that "it is no part of the purpose of this arrangement that the Secretary of State should be involved in, or in any way seek to influence, the management of Network Rail or the manner in which it conducts its business."

The DfT directs the rolling stock strategy for the network in England and Wales. This includes developing high level specifications, directing procurement and defining the strategy for fleet cascades. This rolling stock role has a significant impact on the enhancement programme.

4.2 Transport Scotland

Transport Scotland (TS) is the Government funder for rail enhancements in Scotland. TS has stated its requirements for CP4 in its own HLOS. These are expressed in three tiers:

- Tier 1 – some minor enhancements to improve network performance
- Tier 2 – Glasgow Airport Rail Link, Airdrie to Bathgate and the connection to the future Borders railway

- Tier 3 – development work for a number of future projects.

Similarly to DfT, TS is the Government client for the enhancement programme within Scotland. And, also similarly to DfT, TS is responsible for the rolling stock strategy in Scotland.

4.3 Network Rail

Network Rail is responsible for the safe and efficient operation, maintenance and renewal of Great Britain's rail infrastructure.

Network Rail is required to deliver the enhancements specified by its funders, DfT and Transport Scotland, as set out in their respective HLOSs. Whilst Government is responsible for defining the outputs it wants to achieve, it is for the rail industry, led by Network Rail, to define the best way of delivering them.

The industry has well-established mechanisms for working together to improve reliability. Network Rail takes the lead in this process through the development of Joint Performance Improvement Plans with train operators.

In addition, Network Rail is required to deliver the reasonable requirements of third party funders within its enhancement programme.

4.4 Office of Rail Regulation

The Office of Rail Regulation (ORR) is the independent economic and safety regulator.

The ORR conducts a Periodic Review to determine whether the outputs sought by Government are affordable and deliverable within the funding that Government is providing, and to establish how much it should cost Network Rail to deliver these outputs, based on an assumption of reasonable efficiency improvements. The ORR then determines track access charges and other income that Network Rail should be expected to earn during the control period. From this ORR sets and enforces regulatory targets that Network Rail is obliged to achieve as part of its licence conditions.

Network Rail is accountable to ORR for delivering the enhancement programme in accordance with its agreed Strategic Business Plan. Network Rail is required to report regularly to the ORR to demonstrate that it is meeting its obligations.

ORR monitors Network Rail's delivery, providing timely warning if it believes that projects are slipping or coming in over budget.

4.5 Passenger Train Operators and Freight Operators

Passenger train operators (TOCs) and freight operators (FOCs) operate services on Network Rail's infrastructure, in accordance with their franchise and access agreements.

Delivery of the HLOS outputs requires the involvement of the whole industry including crucially the TOCs and FOCs. Safety, reliability and capacity improvements require a combination of measures involving infrastructure, time tabling, rolling stock and operations.

The train operators are represented collectively by ATOC, the Association of Train Operating Companies. The freight operators are represented collectively by the Rail Freight Operators Association.

4.6 Rail supply industry

Whilst the workforce for maintenance is held 'in-house' by Network Rail, much of the resource for renewals and enhancements is contracted to Network Rail from the supply industry.

The rail supply industry comprises designers and project management providers, specialist rail component manufacturers and contractors, and more generic civil engineering and multi-disciplinary contractors. Much of the rail supply industry is represented by RIA, the Rail Industry Association. Other relevant 'umbrella' organisations include CECA (the Civil Engineering Contractors' Association) and ACE (the Association for Consulting and Engineering).

Network Rail is refining its supply chain strategy and developing a commercial strategy for each asset group. With regard to the CP4 enhancement programme, Network Rail estimates that 15-20% of the work will be routed through its existing renewals frameworks with suppliers; 30-40% will be competed through a new supplier register; and 40-50% will be packaged up and tendered on the open market.

Most rail industry suppliers are UK based, although many have multi-national parent companies. Network Rail wishes to encourage non-UK suppliers to invest in entering the UK market, so as to increase the supply capacity pool.

4.7 Passengers and freight customers

The other important parties to be considered are the end users of the rail network – passengers and freight customers. Enhancements are devised for their ultimate benefit – enhanced safety and comfort, improved reliability, reduced journey times and increased capacity.

However, enhancements necessarily result in reduced services during the works themselves. The end users suffer 'pain before gain'.

Communications with end users is a vital aspect of the enhancement programme – ensuring that customers understand fully the impact of the works on their intended journeys and business.

4.8 Organisational issues

We have described above our understanding of the distinct roles of the various organisational parties. It is however clear that there are major inter-dependencies between some of the organisations. Close co-operation and co-ordination between the parties is essential for the successful delivery of the enhancement programme.

We set out below some of the organisational issues that we believe are of significance:

- **Rolling stock interface** – the interface between the rolling stock strategy and the enhancement programme. This area is led by DfT for England and Wales and in Scotland by Transport Scotland. It is critical to Network Rail in defining depot layouts, stabling facilities, platform lengths and gauging details. Whilst progress is being made, we see this as a potential significant risk for the CP4 enhancement programme
- **Industry co-ordination** – we are concerned that there is no obviously effective co-ordination with other (non-rail) projects that will be competing for external resource
- **Monitoring** – we see a potential overlap between ORR's monitoring role and DfT and Transport Scotland's client roles for the enhancement programme.

We discuss these issues further in Sections 8 and 9 below.

5. The challenge

In this section we will consider the inherent challenges posed by the scale of activity, complexity, multiple output targets and constraints within which the work programme has to be delivered. We will also consider this in the context of delivery progress made in CP3 and the external market environment and demand anticipated in CP4.

5.1 Progress achieved in CP3

During CP3 Network Rail has generally delivered its renewals programme in line with budget. This has involved significant increases relative to levels of activity at the start of the control period for some assets, whilst at the same time broadly achieving targeted levels of efficiency now approaching 30%.

Two asset areas have seen some shortfall in delivery against planned renewals budgets during CP3. Signalling is the most notable of these, where the larger projects are inherently more complex being multi-disciplinary and several of these have been subject to some delay; this has also reflected the additional time taken to secure efficient designs and affordable contractor prices. Electrification and plant (E&P) was also subject to some shortfall in the first couple of years of CP3, whilst Network Rail developed its internal capability to respond to the increased workload.

Network Rail has also generally delivered two significant major projects broadly according to plan: i.e. the Southern Region New Trains Programme (where cost reductions reflected secured efficiency) and the West Coast project.

By comparison, the performance on other planned enhancements has not been as predictable. Delivery of the NRDF enhancement programme for instance has been slow, with circa £70m of the allotted £200m funding forecast to be completed by the end of this year which is the third of the four years for which funding was provided in CP3. This to some extent reflects the problems associated with securing external inputs to projects. Other delays associated with third party funded projects reflect difficulties in securing external funding approvals. This is indicative of the difficulties in maintaining planned progress on this type of project.

Recent slippage against the 2007/8 investment plans is described in the ORR Q3 Monitor³. This identifies two significant trends: “Renewal and enhancement work continues to be deferred on a regular basis: expenditure was 12% below budget in the year to date, largely as a result of deferrals and project delays.”

³ Network Rail Q3 Monitor, ORR, February 2008.

Network Rail has recently advised updates to its planned investment activity in 2008/9. Movements between the October 2007 Strategic Business Plan and the March 2008 refresh indicate significant slippage from CP3 into CP4, notably in electrification renewals and property enhancement.

5.2 Volume of work in CP4

Network Rail has published its own assessment of the combined demand for renewals and enhancement activity as part of the SBP, and has recently provided us with a refresh of this analysis. The update reflects changes as a result of adoption of consistent metrics across the portfolio, additional definition of enhancement projects, updating of Crossrail forecasts and deferral of activity from CP3. **This has led to significant increases in some activities, illustrating that the forecasts may not yet be stable.**

In this data, activity is considered by asset type and the metrics used are either units of input volume or pre-efficient expenditure levels, as these provide the most reliable indicator of absolute volume. It is relevant to combine renewals and enhancement activity, as noted above, since the input work types are broadly equivalent. We have also extracted equivalent measures of the same activity during CP3 from previous Annual Assessments⁴ and the Network Rail's 2008 Business Plan⁵, in order to provide a relevant context for these future demands.

We have noted that these activity forecasts exclude investment associated with those programmes which are not yet well developed - such as Performance improvement, 7 Day Railway and some of the NRDF - and also make no allowance for contingency. **As such these activity forecasts may omit as much as a further £1bn of enhancement activity.**

Figure 8 overleaf presents our assessment of the volume of work planned in each year of CP4 as a percentage of the average achieved during CP3, by asset. We have annotated this with our observations.

⁴ ORR Annual Assessments of Network Rail, 2004/5, 2005/6, 2006/7

⁵ Network Rail 2008 Business Plan, March 2007

Activity levels relative to CP3 average

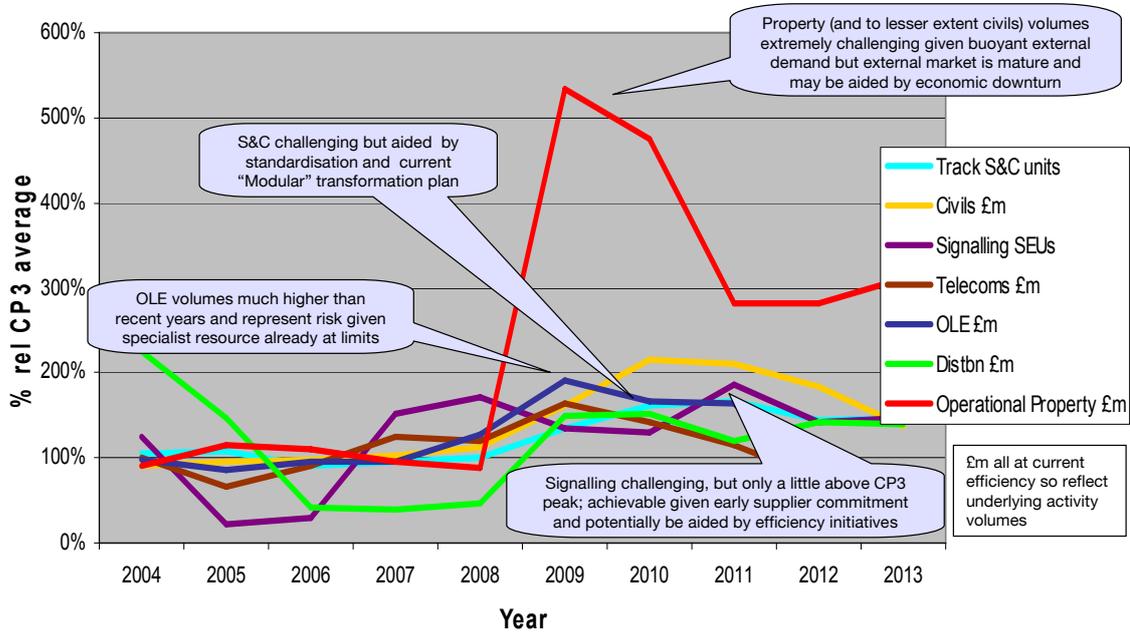


Figure 8: Activity volumes in CP4 relative to CP3

For Track the volume presented is that of Switch and Crossing (S&C) units, as this is recognised by Network Rail as the most demanding/resource constrained. Planned S&C volumes up to 68% above the peak achieved in CP3 will be very challenging, although standardisation and modular installation initiatives will allow improved productivity. Signalling volumes also appear challenging, but are in fact only circa 10% above the peak achieved/planned in the last two years of CP3. For E&P we concentrate on OLE delivery as recent experience has also shown this to be resource constrained; as such the planned early peak in 2009/10, which is double the volume in the current year, appears unlikely to be achievable. The extreme growth in property delivery in the early years of CP4 in particular also appears unrealistic; although the external market may be capable of responding to this demand, it seems unlikely that Network Rail has the internal capacity to develop and manage this workload.

Figure 9 overleaf presents the rate of change of activity volumes by comparison with the previous year's actual/planned delivery. Again, we have annotated the graphs with our observations. Rates of increase of activity are relevant as the ability to grow both internal and supply chain capability is limited and, although there is no finite growth limit, annual rates of growth above 30% are likely to be very challenging, especially where supply is already stretched. **The growth planned for Property, Power Distribution and OLE activities in 2009/10 all appear unrealistic on this basis.**

Activity growth rates

growth rates are higher than desirable for some activities: may be bearable by market at a cost, but likely to pose major stretch for NR own mgt capability

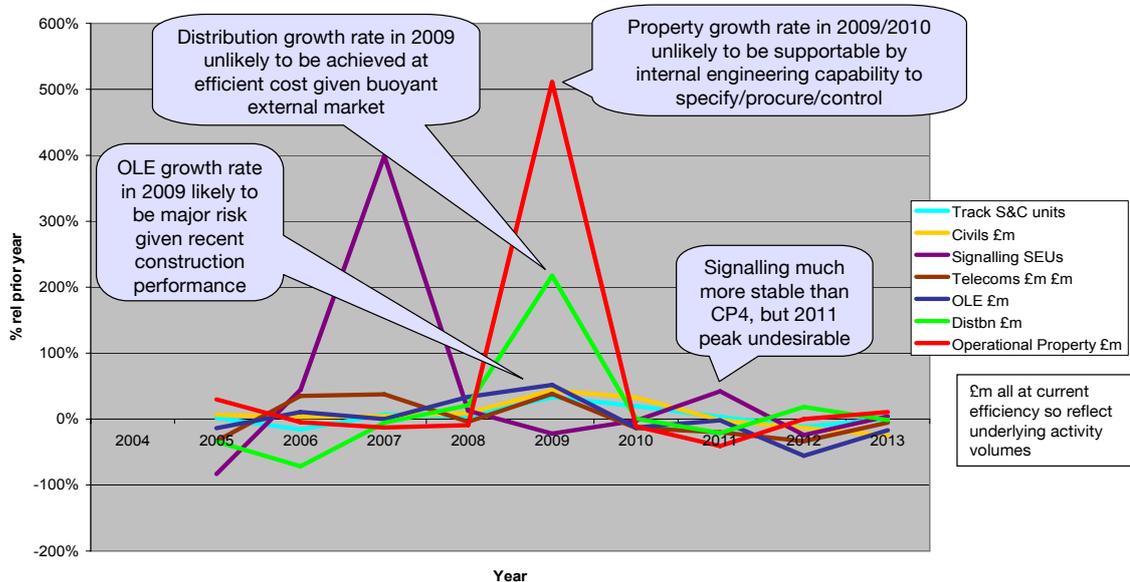


Figure 9: Activity growth rates

5.3 Inherent complexity

As noted in Section 3.1, a number of factors make enhancement inherently more complex than equivalent renewals expenditure. These include for instance the requirement during development to demonstrate that the desired outputs can be achieved efficiently, and the need to secure external approvals to undertake change. They are also typically characterised by being multi-disciplinary, whereas renewals works are generally undertaken as single engineering disciplines.

Inspection of the scope of work for the various HLOS projects confirms that they are in the main multi-disciplinary, with the majority typically involving civils, property, track and signalling works. Some of the sub-programmes such as the Access for All and NSIP enhancements are less complex being primarily property discipline.

The majority of the HLOS projects are valued at between £10m and £250m. The £10m threshold is arbitrary, but we have used it here as it is the upper threshold for complexity which Network Rail has itself applied in its own project management capability maturity assessment. **Circa 80% of the HLOS projects by number and 95% by value are above this value threshold.**

We will examine the implications of this complexity in terms of the likely management resource and capability requirements in Section 6.

5.4 Safety

One of the HLOS output requirements is the objective of improving passenger and workforce safety by 3% over CP4. Network Rail has described its plans to respond to this target in the SBP and supporting documents. These plans are not heavily dependent upon specific enhancement investment programmes; the main element which is linked to investment is the ECML level crossing closure programme. We do not have any reason to doubt that this is capable of being delivered, notwithstanding our general comments on scarcity of resource.

ORR has recently written to Network Rail⁶ noting a series of safety challenges which it expects Network Rail to respond to within its Strategic Business Plan. These may be summarised as:

- **Organisational culture** – the delivery of the SBP will require a high level of performance by Network Rail and its industry partners. The delivery will be highly dependant on the organisational (safety) culture. Network Rail is particularly active in this area and this will need to continue in order to achieve the frontline performance and plans.
- **Asset management** – there will be a continuing need to develop strategic approaches to asset management that deliver coherent rail system performance on safety.
- **Resources and competences** – the changes to the railway will present significant challenges to the rail sector and are requiring major initiatives to meet them. This will redefine resources and competences required to deliver the plan.
- **Assurance** – the senior management team must ensure that they have good intelligence about performance on the ground.

The total risks to the whole workforce will, everything else being equal, be a function of the volume of work undertaken, although the risk to individual workers will not increase. As additional enhancement projects are undertaken, this will increase the number of workforce hours deployed and may stretch management resources. Network Rail has stated that it remains its priority to ensure the safety of its activities, and it will only undertake projects if these can be done safely. At the scale of activity envisaged, there is no reason to suppose that this cannot continue to be undertaken in a safe manner, given adequate management commitment and attention.

From the limited examination of the SBP and supporting documents and discussions held during this review, we have no reason to doubt the achievement of a safe railway and the HLOS safety targets.

⁶ Letter from Sally Williams at ORR to Rod Reid at Network Rail, 22/02/2008

5.5 Performance

The HLOS sets targets for a significant improvement in train service performance across the network. Network Rail has responded to these in some detail within the SBP and supporting documents and, in addition to £368m of specific projects, has identified its intention to devote some £250m of unspecified investment in support of this target. ORR has noted that it remains unclear exactly what investment is planned and how this will be achieved. It is outside the scope of this review to comment upon the achievability of the performance targets. We note however that it is unclear whether this potential additional investment activity required to achieve performance improvement has been included within the activity forecasts in the Network Rail assessment, and that this would inevitably place a further stretch on these resources if it is required.

Network Rail has stated that the required performance improvement will be challenging to achieve with an increasingly busy network. The potential for engineering over-runs, and temporary speed restrictions required after engineering works are not the major cause of train delays; but the additional volume of engineering works required by the SBP will nonetheless inevitably increase the delays from these sources, even without any change in access regime. We note that the plans to move to an alternative 7 Day access regime will also have a further impact, and these are considered in more detail below.

5.6 Engineering access

Access is traditionally a critical limiting constraint on the ability to undertake engineering projects. The increased volumes of work envisaged within the SBP will inevitably require more access than hitherto. Network Rail has not yet indicated exactly what impact it expects the SBP investment plans to have upon access requirements in CP4. There is some potential to undertake more work by packaging multiple worksites within a single possession. This was undertaken to considerable benefit during CP3 on the West Coast project, for example. However it does require additional planning, impose scheduling constraints and may introduce some logistical and performance risks.

By definition, much of the HLOS enhancement is on the busiest parts of the network. Securing access to undertake the required projects is therefore likely to be significantly disruptive to train services. Although this type of project work has been undertaken across the network in the past, finding an access pattern acceptable to operators is likely to extend planning and construction timescales.

Some of the efficiency initiatives envisaged by Network Rail will offer opportunities to increase the productivity of works undertaken within possessions. One such initiative is planned to reduce the time required for taking and giving up possessions. Others are intended to allow plain line and S&C track renewals to be undertaken in shorter mid-week possessions. Still

others will reduce the time required for signalling testing and commissioning. These can have a major positive impact in reducing the overall demand for disruptive weekend access for renewals, freeing up these slots to allow more complex enhancement activity to be completed. **However, the success of these access efficiency initiatives remains to be demonstrated and is unlikely to have a significant impact until the later years of CP4.**

Network Rail's plans to move to a radically new and more customer friendly access pattern, known as the 7 Day Railway, create a specific further delivery challenge. The increasing industry expectation around this change in itself presents a significant further risk to delivery of the enhancement programme. We will discuss this in more detail in Section 8. Network Rail has identified provision of some £350m of investment in support of this strategy, although ORR has told Network Rail it must provide a stronger business case before any funding could be justified. As we noted for performance related investment above, this potential investment activity has not been included within the activity forecasts in either Network Rail's or our own assessment, and this would inevitably place a further stretch on track, signalling and overhead line resources if required.

5.7 Efficiency

It is outside the scope of this report to comment upon the specific efficiency targets which may be set as part of the Access Charges Review. We note that there is still some difference of opinion between ORR and Network Rail as to what is a realistic target and trajectory for efficiency, and that this in itself creates some further uncertainty at present.

Efficiency poses a challenge to do things differently, to innovate, and to demand greater competition in supply. These processes may ultimately be successful, but they can frequently take longer than simply continuing to do things in a conventional manner. However, we note that the efficiency targets introduced in CP3 delaying planned renewals investment during the early years of CP3, until acceptably efficient solutions had been secured.

The pursuit of demanding efficiency targets will consume management time and attention both for Network Rail and for its suppliers reducing the time available to manage complex enhancement projects.

Nevertheless, it is not unreasonable to expect efficiency to be pursued in parallel with increased delivery. It can offer opportunities to reduce scope of work, and improve utilisation and productivity, thus releasing resources for other projects. The issue is how to best balance the challenges involved in the increased enhancements programme and the drive for efficiency.

5.8 Interdependencies

Complex investment programmes which have many inter-linkages are inherently riskier than free-standing renewals programmes, and as a result are more likely to be delayed.

There are several main sources of dependency:

- **Outputs** – several projects may be required to contribute to a successful overall output; although this is commonly the case in relation to the HLOS, the DfT broadly carries this output risk
- **Specification** – the specification for one project may be uncertain until another project has reached a certain level of development; this applies in respect of certain fleet procurement projects and the HLOS
- **Shared resources** – many of the enhancement and renewals programmes will call upon the same resources as has already been described above and changes in phasing or demand for one can have knock-on implications for others that are planned at the same time or later
- **Geography** – multiple projects may take place in the same vicinity, or on the same line of route, causing competition for access and logistics; although this applies to the enhancement programme, it has already been mitigated to some extent with combinations of smaller projects at busy nodes such as Reading.

5.9 External demand

As discussed in Section 5.2 above, Network Rail has gaps in the current staffing and available skills within its existing organisation. To meet the planned enhancements programme it will certainly need to recruit and train many more professional managers and specialist staff. That will take time and is likely to prove difficult, especially in view of the unprecedented demand for the same resources from major infrastructure and other construction projects both in the UK and overseas which is forecast over the next five years.

Even more significant, however, is the impact of the increased level of construction activity both domestically and globally on Network Rail's supply chain, which will need to provide around 90% of the resources required for the enhancements programme.

Other UK projects

Over the five years of CP4, there are many major infrastructure projects planned within the UK, including:

Major railway projects

- Thameslink
- Crossrail (in addition to NR's works)
- London Underground enhancements (including East London Line, PPP upgrades and renewals)
- Manchester Metro
- Glasgow Underground
- Olympic rail projects

Other mega projects

- London 2012 Olympics
- Kings Cross redevelopment
- UK ports developments at Shellhaven, Felixstowe, Southampton, and Harwich
- Thames Gateway – East London residential development as part of Government's house building programme
- Government's house building programme (250,000 houses per year)
- Thames Tideway (38km tunnels to store and transfer wastewater)
- other water companies' planned expansion works
- M25 road widening
- other major road programmes
- airport enhancements (including Heathrow East terminal expansion and Stansted expansion)
- National Grid – national power network reinforcement
- Commonwealth Games
- major telecoms upgrades
- nuclear decommissioning (mainly Sellafield and Dounreay)

- new nuclear power stations (early work).

The biggest impact on NR's enhancements programme will be competing demands for scarce railway specific skills (e.g. signalling designers and commissioning, OLE design and installation) as well as commercial, project and programme management professionals.

There are also geographic 'hot spots', notably in London and the South East and in the Glasgow/Edinburgh belt in Scotland.

Overseas supply and demand

Network Rail is looking to draw in more suppliers from abroad – especially from the continent of Europe, to provide more price competition and overcome capacity limitations in the domestic supply industry. Obviously, for railway specific work at least where it is the dominant customer, it must balance this against its need to maintain a stable and healthy UK supply base. However, there is a high and rapidly rising level of international demand – especially from continental Europe, the Middle East, India, China, other Far Eastern countries and Australia – for the services of UK and overseas contractors.

Prices may rise significantly. Higher than expected cost inflation could substantially reduce the scope of enhancements work affordable within the agreed funding limits.

The above sections demonstrate that the CP4 enhancement programme will entail very considerable additional challenges in terms of scale and complexity, beyond those of the predominantly renewals programme delivered in CP3.

In addition the constraints imposed by access and the additional challenges associated with performance and efficiency will represent a substantial stretch for Network Rail's management.

6. Current capability

We have looked at the current capabilities of Network Rail and the external supply chain.

6.1 Internal resource

As indicated in Section 2, key facets of capability include quantum of resource and competency; we will consider each of these in turn. Network Rail's current and forecast internal resource levels are set out in its Sales and Operations Planning (SOP) data. We have reproduced extracts below.

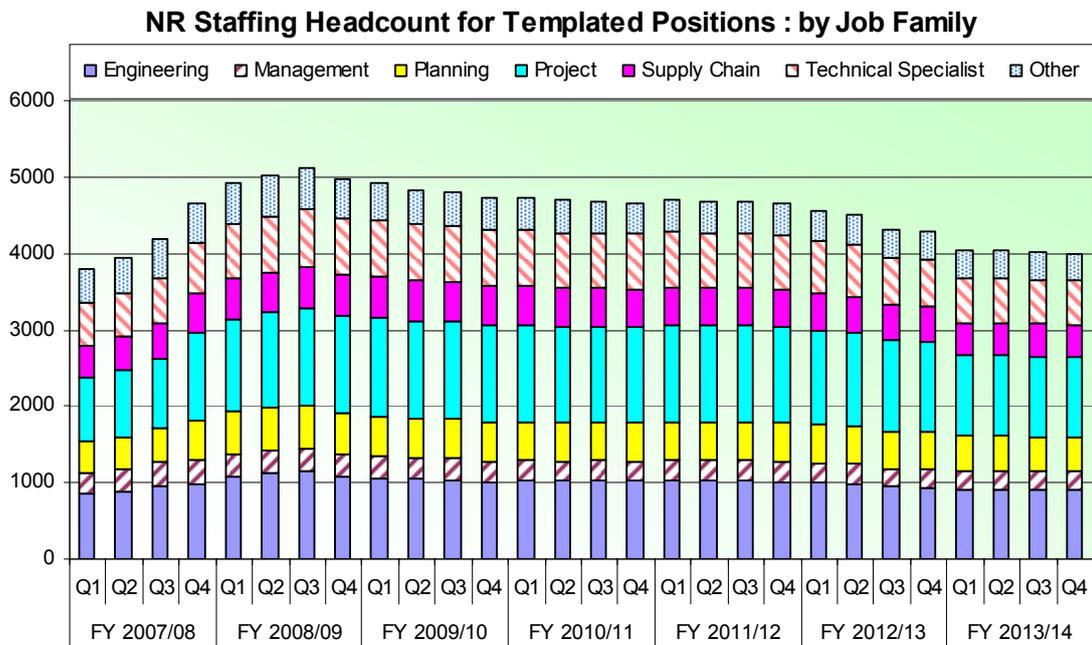


Figure 5: NR staffing headcount by job family

NR Staffing Headcount for Templated Positions : by Asset/Project

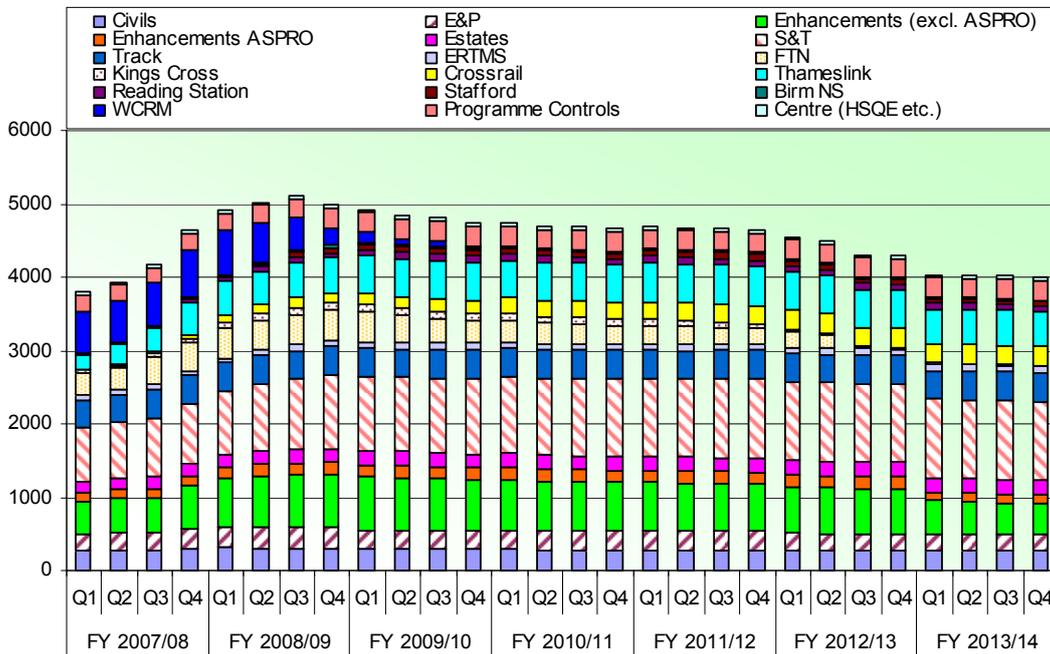


Figure 6: NR staffing headcount by asset/project

Source: Network Rail IIG Staffing Return Period 11

As can be seen from this assessment, Network Rail’s staffing headcount at Quarter 3 of Financial Year (FY) 2007/08 was approximately 4,100 staff. At the end of Period 12, Network Rail has advised that it currently has 3,823 Infrastructure Investment permanent staff and a further 521 agency personnel, making a total of 4,344.

Network Rail is forecasting this growing to around 4920 staff by Quarter 1 of FY 2008/09 and reaching a peak of a little over 5,100 staff in Quarter 3 of the same year. This indicates a requirement to secure approximately 800 additional staff within six months and around 1,000 additional staff within 12 months. We understand that NR is however planning to recruit at a lesser rate than this – around 700 to 800 staff over the next two to three years – and intends to accommodate the peak of its headcount forecast through the use of further agency resources. It also has the opportunity to buy in additional professional services support.

In fact, although it has been busy recruiting, Network Rail has only been able to secure an average of 40 net recruits a period, plus a further 10 agency personnel per period during 2007/8. In view of this, a growth rate of 400 per year would seem more realistic. The implication of this however, is that the project management resources will need to achieve higher levels of productivity (output per head) if investment is to achieve planned levels.

We have used Network Rail’s internal resource forecasts from the SOP data together with its investment forecasts to derive assumed output per head of internal resource. This indicates a planned step change or doubling in enhancement project management productivity between Quarter 4 of FY 2008/09 and Quarter 1 of FY 2009/10, which we regard as extremely

challenging. At the same time it also indicates a slight reduction in productivity for the renewals teams. Our observations are annotated in Figure 7 below.

Network Rail has indicated that it would intend to manage 15-20% of the delivery of enhancements through the renewals teams in CP4 and, were this to be achieved, it would help to re-balance some of the productivity demands implied by the SOP forecast. Nonetheless in view of the difficulty in achieving the headcount forecast we consider the overall productivity implications to be very demanding.

Internal Resourcing

Some productivity assumptions appear flawed, and may therefore understate required resources

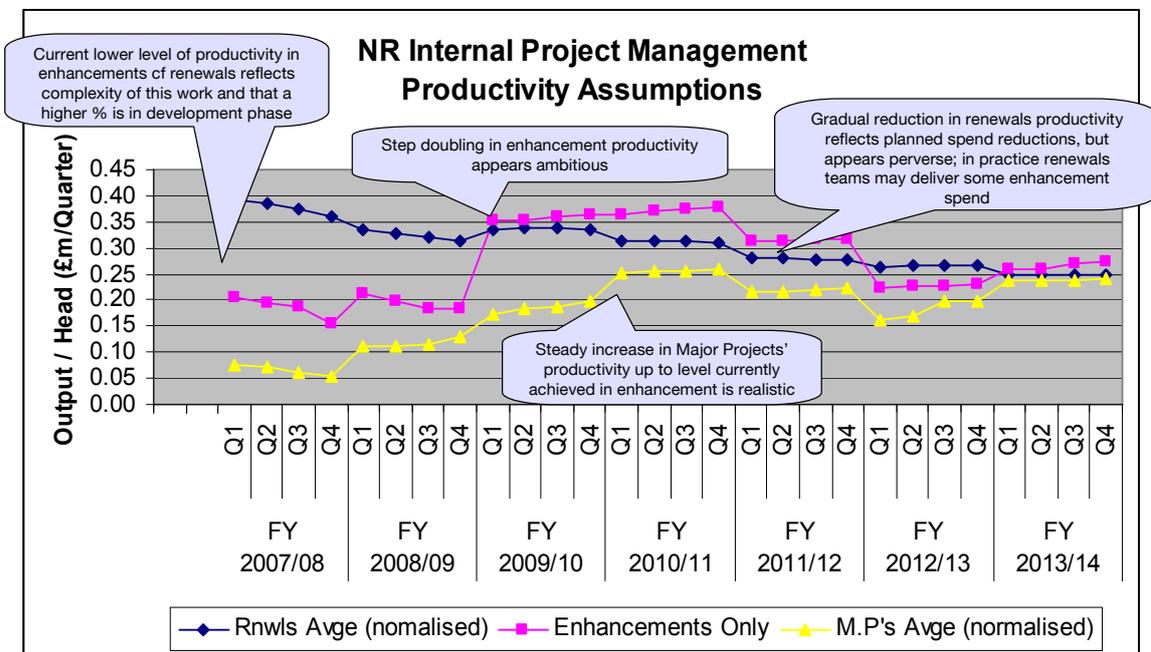


Figure 7: Internal resource productivity assumptions

Network Rail's SOP forecasts also breakdown the resource demand by discipline. We consider the critical resource areas to be:

- **Engineering** – we note the intended increase in engineering is +19%. The increased requirement to manage development and design activity within enhancements might suggest a higher demand for engineering.
- **Planning** – a specialist discipline much in demand for enhancements is that associated with securing TWA and external planning approvals. As we have seen in Section 5, the number of schemes requiring this is growing strongly in CP4. Network Rail has advised that it is intending to establish a National Centre of Excellence based around the team of 30 or so established to support this activity within the West Coast project. This would appear to be an efficient means of supporting the increased demand, although we are not

convinced that the organisation proposed will grow fast enough to meet the big increase in this activity over the next two to three years.

- **Supply chain management** – the level of procurement and contract management activity associated with enhancements tends to be greater than that for renewals, so it is perhaps surprising that there is not a plan for further growth in this area. We note that Network Rail's planned asset category supply strategies, and intention to utilise renewals supply channels, will help to improve the productivity of this resource, thereby to some extent reducing demand.
- **Project management** – we note that the highest anticipated growth area (+44% between Q3 FY07/8 and Q3 FY08/9) is in project managers. Given that this discipline will be particularly important to the successful delivery of enhancements, we find the planned growth in this area encouraging. We note however, that project managers are in strong demand, especially in the South East, and so it may prove difficult to recruit to the required numbers. As will be discussed below, our concern is less about the quantity of project managers and more about the quality.

In summary, it would appear that Network Rail's internal resource forecast may somewhat underestimate the likely demand, particularly in relation to the enhancement programme, and specifically in engineering, planning and supply chain disciplines. In addition, based upon recent experience, it is likely that Network Rail will struggle to recruit at the levels required to support this plan.

6.2 Competency maturity

Network Rail measures its organisational capability and competency by means of a Capability Maturity Model (CMM). This provides an objective periodic measure of the project management capability of the Infrastructure Investment division. The trend is of more significance than the absolute score. It should be noted that the measurement is entirely self-assessed. However a large number of other project organisations across the world have applied the same maturity assessment, and for these a score of just below 3.5 was average, and scores above 4.0 were world class.

Network Rail first measured its capability using this model in Summer 2006, and has repeated this in October 2007. This provides a measurement of process maturity and competency by programme and also by discipline. It has also been used to compare differences between those teams delivering small (<£1m), medium and large (>£10m) value projects.

The CMM score of NR's overall organisation was 3.51 in 2006, and had increased to 3.71 in October 2007. This is a creditable improvement, although a little less than the planned score of 3.75. The Enhancement Programme directorate has consistently demonstrated a maturity better than the average; in Summer 2006 this was measured as 3.75, and in October 2007 was 3.80. This is perhaps not surprising as one might expect the challenges of enhancement

projects to be more demanding than routine renewals and therefore require a higher level of competence.

The capability level associated with delivering larger projects is also greater than that required for smaller projects. In October 2007, the overall score for teams on small projects was 3.48 and that for teams on large projects was 3.99. Although this is not a precise measurement or scale, the difference of 0.5 gives an indication of the level of additional competence required to successfully deliver larger projects. As commented in Section 3 above, 95% of the HLOS programme by value comprises projects valued individually at over £10m.

Network Rail has targeted a score of 4.15 for the enhancements programme at its next assessment planned for June 2008. NR has noted that the challenge in achieving a given level of improvement is likely to get more difficult the higher up the scale one aspires to achieve, and we would accept this. We will comment further on Network Rail's approach to developing its capability in Section 7. For now, we will note simply that this would require a rate of capability maturity improvement far exceeding that achieved over the previous 15 months.

The disciplines which scored best within the October 2007 assessment were scope management, estimating and procurement. This is reassuring as these are important disciplines for enhancement activity. However, those which scored lowest include planning and quality management and we would expect to see a focus on addressing these within Network Rail's plans.

Although the adoption of an improvement approach based around a Capability Maturity Model and external benchmarking is a good step, it is not evident that Network Rail has established a concerted change programme focussed on delivering the specific competency improvements needed to successfully deliver the enhancement challenge in CP4.

6.3 External resource

In addition to Network Rail's internal resource, its capability to deliver the workload of CP4 is highly dependent on external resources. The materials to be used in the delivery of the enhancement programme and much of the technology and expertise will be sourced from the external rail supply industry. Over 90% of the manpower will be contracted to Network Rail by suppliers under many contracts.

Network Rail has carried out a substantial exercise to analyse the required workload of the CP4 enhancement programme, under key asset work-types. Particularly critical resource areas identified are:

- Signalling – design and testing
- OLE – design, installation and commissioning.

Given the limited extent of our review, it has not been possible to gauge with any great confidence the current capability of the external industry for the CP4 programme. However, the indications are that suppliers believe the growth in volumes required by the plan can be delivered. This is however dependent on a number of factors including:

- maintaining stable and mature relationships between Network Rail and its suppliers
- introducing improvements to supply chain processes and culture
- encouraging supplier confidence by maintaining consistency of demand forecasts
- smoothing peaks and troughs
- ensuring that procurement reflects the same demand forecasts
- establishing long-term work banks, thereby locking-in suppliers and enabling investment in R&D and securing efficiencies, although this is limited by the 5 yearly funding review cycle
- providing training in special-shortage skills areas.

The view of the suppliers is summarised in RIA's response to the SBP⁷ as follows: that the required volumes should be deliverable; that the CP4 efficiency gains are likely to be at the top end of the range achievable; and that the forecast for input prices of labour is likely to be too low.

Whilst the majority of the external resource is sourced from within the UK, international recruitment remains an opportunity for suppliers. However, it is necessary to recognise the growing competing demand for specialist rail resource in other countries in Europe as well as in the Middle East, the Far East and Australia. Where resources are drawn from outside the UK, conversion courses have been provided to train overseas operatives in UK practices.

Network Rail is proactively engaging with its supply chain in recognition of the critical role that plays in the successful delivery of the enhancement programme.

6.4 New Year overruns

Much of Network Rail's engineering works is necessarily carried out during planned possession of parts of the network. Most of this work is performed successfully with no disruption to scheduled services. However when work overruns, the impact on rail users can be severe, as was the case at Rugby, Liverpool Street and Shield junction in early January 2008. These events have caused observers to question Network Rail's capability to manage its enhancement programme, particularly as the programme grows in scale as is planned for CP4.

⁷ RIA: Summary of responses from Working Groups, 14 January 2008

The ORR report of the investigation into the overruns⁸ brings into sharp focus the variable quality of Network Rail's project management – particularly planning and risk management. It is apparent that the Rugby overrun was caused mainly by a shortage of skilled and supervisory OLE resources, despite measures that had been taken to identify rostered staff in advance by name. The quality of project management at Rugby is not identified by the ORR as a significant cause of the overrun. However, at Liverpool Street, and even more so at Shields Junction, the project management was found to have been less than satisfactory.

There are clearly lessons that Network Rail is learning from the January 2008 overruns. The ORR will wish to be satisfied that these lessons have been learned and that appropriate measures are being taken before CP4.

⁸ ORR: Report of ORR's Investigation into Engineering Overruns, February 2008

7. Enhancing capability

Network Rail's response to the challenge presented by the greatly increased enhancements programme can be considered under four main headings:

- Increasing staff levels and competence
- Organisational change
- Enhancing overall effectiveness
- Increasing efficiency
- Improving external resources.

7.1 Increasing staff levels and competence

Staff competence is being improved in a numbers of ways, notably through:

- personal development plans
- corporate leadership programme
- MSc in Project Management initiative
- targeted discipline improvements (e.g. estimating).

7.2 Organisational change

NR's presentation of September 2007, states that it proposes to adopt some of the principles used by their Information Management department in its recent reorganisation. These establish a form of matrix structure in which everyone in Infrastructure Investment will be put into one of around 70 "Practices", each with 30 to 60 staff, ranging in expertise from trainee to expert in a particular skill area (e.g. signalling, access planning and project management).

The practices, reporting to a Programme Management Office, form resource pools from which staff are allocated to the projects directed by each of a number of Delivery Units.

Matrix management of a similar type is employed by many organisations involved continually in large programmes of change – including contractors, consultants, designers and systems developers. It combines a focus on development and maintenance of professional competences with a concentration on management of delivery of projects and programmes. It also maximizes flexibility in deployment of resources between projects.

However, it is more complicated to operate than more conventional structures as, essentially, everyone has two (or sometimes even more) reporting lines. To be successful, everyone involved needs to understand fully the operating principles. Implementing such a structure in a large organisation can be a big challenge and takes time. Generally, as with all major change programmes, performance tends to deteriorate before it improves.

In the case of Network Rail, it is not clear exactly how and when the full implementation of matrix management will take place – although Network Rail have provided us with a brief update on their thinking and have stated their intention to implement later in 2008, we have not seen a detailed implementation plan or timeline.

7.3 Enhancing overall effectiveness

As a means of focusing on and measuring improvements in their capability in infrastructure investment, Network Rail has used a Capability Maturity Model (CMM) developed by the University of California in conjunction with the CMMI. We referred to this in Section 6.2 above.

The most recent CMM assessment undertaken in Autumn 2007 involved the project managers and scheme project managers of some 65 projects, selected from within the Infrastructure Investment portfolio, completing detailed questionnaires. The results are used to review Network Rail's capability in comparison with other world-class organisations and to identify areas for improvement.

The maturity scores achieved and targets for the next stage of development were discussed in Section 6.2. The overall initiative is being co-ordinated by Programme Controls, but CMM action plans are led by each programme. Part of the focus would appear to be on ensuring those who complete the questionnaire understand how to interpret the questions, rather than identifying root causes and targeted improvement plans. However, we have not had an opportunity to conduct a thorough assessment of Network Rail's plans in this area.

7.4 Increasing efficiency

Network Rail's efficiency plans demonstrate that they are planning to progress a wide variety of initiatives which will yield cost efficiency, a number of which are already underway. Many of these may also make a contribution to reducing the demand for resources. Scope efficiencies will reduce the quantum of activity required to achieve a given output; planning efficiency will improve utilisation by smoothing demand; process efficiency will potentially increase the productivity of resources.

Although the efficiency plans are directed at Network Rail's renewals portfolio, some may also assist delivery of enhancements, and will in any case reduce the overall demand for resources.

Some of the initiatives planned are directly targeting activities which are currently constrained by a shortage of specialist resources. Examples of these are:

- modular S&C
- standardisation of civil engineering designs
- modularisation and pre-testing of signalling components
- process improvements in signalling testing and commissioning
- OLE construction process improvements.

We have made a provisional assessment of the potential resource efficiency benefits associated with Network Rail's plans. This suggests that benefits of up to 20% in internal resource efficiency and 10-15% in supplier productivity may well be achieved within CP3. These benefits will potentially offset the activity increases indicated in Section 6. **However, it is likely that the most significant efficiency improvements may take several years to realise, and will therefore not be in time to assist in delivery of the increases in activities in the early part of CP4.**

7.5 Expediting development

Network Rail have implemented an internal improvement programme known as E500, geared towards simplifying and speeding up the rate of development progress on smaller externally funded enhancement projects. This is addressing process and internal competency, particularly in terms of sponsorship. This initiative has already had some impact in improving the development throughput particularly in respect of the NRDF programme. We understand that Network Rail is continuing to progress a further stage of this initiative. It is possible that this will have benefits in helping to speed the rate of development of the HLOS projects. However we believe that the scale of these and their greater complexity may not in many cases lend themselves to a similar degree of speed-up as has been achieved for NRDF.

7.6 Improving external resources

RIA, representing a major part of the supply chain, is obviously keen to support and collaborate with Network Rail in gearing up to meet the challenge of the increased enhancements programme. Suppliers are pleased with the opportunity to participate, to some extent at least, in a number of NR training and re-skilling initiatives – including:

- conversion courses for staff coming into rail from other industries
- apprenticeship training at Portsmouth
- leadership and management development supported by Warwick University

- MSc in Project Management initiative.

RIA would like to see stronger backing for non-rail specific qualifications, such as NVQs. They are also enthusiastic about the potential contribution which can be made by the Rail Industry Skills Forum, led by NR but supported by the supply industry; and provision of financial support for collaborative training. RIA thinks that Early Contractor Involvement (ECI), as a method of procurement, could ease some pressures on resources.

8. Key issues, risks and opportunities

8.1 Input/output linkage

There seems to be general agreement that the HLOS approach to defining requirements at Government level is a major step forward, focusing as it does on desired outcomes rather than prescribing the inputs to achieve these. However, this is the first time that the approach has been adopted in the transport sector and therefore with the several different organisations involved, there is some risk that there could be a disconnect between what the sponsoring department states it wants, the specific infrastructure enhancements offered to meet them and the service capacity and performance which the TOCs and FOCs are then able to provide. The complex industry structure as discussed in Section 3 generates a further risk in this regard.

The only way to mitigate this risk effectively is to ensure a close collaboration between the parties in planning the enhancements, monitoring progress against outcomes, and reviewing and agreeing any necessary changes as the programme is developed and implemented.

This is especially important in view of the early stage of development of many of the planned schemes and hence the inevitable unreliability of the cost and timing estimates. This means, of course, that there can be no certainty that the full planned programme can be delivered for the funding agreed, and this will present a significant challenge.

8.2 Development progress

As illustrated in Section 3, there is still considerable uncertainty in the programme, due to the fact that much of it is at an early development stage. It will be important for funders and users that considerably greater certainty and predictability is secured as quickly as possible.

In order to ensure that there is a clear focus on making progress in this regard it may be appropriate to consider setting targets for the rate of development progress.

8.3 Rolling stock interface

We noted in Section 4 that the interface between the rolling stock strategy and the enhancement programme, led by DfT and Transport Scotland, is critical to Network Rail in defining depot layouts, stabling facilities, platform lengths and gauging details.

We note that Network Rail is responding to these requirements following the recent publication of the DfT rolling stock strategy for CP4. However this is not yet well developed or included in the SBP funding plans. We see this as a potential significant risk area to the CP4 enhancement programme.

8.4 Demand forecast

As indicated in Section 5, activity demand forecasting for the enhancement programme is incomplete in relation to those sub-programmes currently excluded and unstable in respect of the early development status of many projects. This is obviously undesirable, and will undermine the ability of Network Rail and its suppliers to plan the development and allocation of resources effectively.

We believe it is essential that further efforts are made to generate a comprehensive resource plan, including some provision for contingency. At the same time it is important that a distinction is made in such a plan between those elements which are at different levels of certainty. It will also be important to place this resource plan under effective change control as project scopes and schedules are subject to change.

8.5 Phasing of delivery

Network Rail's proposed delivery schedule is ambitious given the current development status, and generates a significant peak in the first two years of CP4. One option to deal with this, which we believe is worth considering, is to re-phase some of this activity to later in the control period. This would have the joint benefits of allowing a more gradual ramp-up in activity, and also allow more time for enhanced capability to be developed. A further option may be to consider re-phasing some of the enhancement activity into CP5, although this would obviously have potential implications for the delivery of the HLOS outputs.

8.6 Access strategy

As we discussed in Section 5, the engineering access strategy will be a key constraint on delivery. ORR has stated that it intends to improve incentivisation on Network Rail to make efficient use of access. It is planning to introduce a network availability metric for CP4, which will monitor usage of network access for engineering; ORR has consulted on options for this.

Each of the parties consulted has indicated their broad support for the alternative 7 Day Railway access strategy which Network Rail has promoted. However they have also recognised that it will be a considerable challenge to make progress on this at the same time as delivering increased volumes of work. It will be important that any targets which are set in this regard do not overly constrain opportunities to deliver the planned enhancements.

We have refrained from making any specific recommendation in relation to this, as we understand Network Rail is still developing its access strategy for CP4.

8.7 Network Rail internal capability

In Section 6 we suggested that Network Rail's internal resource forecast may somewhat underestimate the likely demand; particularly in relation to the enhancement programme, and specifically engineering, planning and supply chain disciplines. In addition, based upon recent experience, it is likely that Network Rail will struggle to recruit at the levels required to support this plan.

Although the adoption of an improvement approach based around a Capability Maturity Model and external benchmarking is a good step, it is not evident that Network Rail has a focused plan to address areas of current weakness.

We believe that Network Rail would benefit from establishing a concerted change programme, focussed on delivering the specific capacity and competency improvements needed to successfully deliver the enhancement challenge in CP4.

8.8 Supply chain confidence

In order to respond effectively to the demands of the enhancement programme in CP4, the supply industry needs to develop confidence that the programme will happen, in the volumes forecast and in the timescales stated. This will inform suppliers' future investment decisions relating to manpower recruitment, training and development, manufacturing capacity and business development in alternative markets.

Any apparent lack of transparency between Network Rail and the supply chain acts to dent this confidence. This consequently represents a risk to the market's capability to deliver the programme.

8.9 Industry skills development

The rail supply industry operates in a competitive market. Suppliers will individually take a view on the share of the enhancement programme that they will expect to win. They will base their skills development programmes upon this assessment.

A joint industry programme would enable Network Rail to gain confidence that there will be sufficient capacity and capability in the market as a whole to support the overall rail enhancement programme.

8.10 Managing interdependencies between NR and other industry programmes

With the wave of major new infrastructure projects planned over the next five years and beyond, as outlined in Section 5.9, there would be benefit in devising some form of cross-project co-ordination between the various sponsoring organisations in order to:

- collaborate in initiatives to develop scarce skills and supplies of critical materials and equipment
- cooperate in dealing with interactions and conflicts between projects (e.g. pursuing together opportunities to co-ordinate logistics, sharing supplies, dealing with spoil, etc.)
- ensure through effective communications that the public at large appreciate and take pride in the enormous improvements being planned and implemented, and therefore become more tolerant of the inconveniences caused by the works in the meantime.

Consideration should be given to how such cross-project/cross-industry co-ordination could be led, or at least encouraged, by the Government.

9. Recommendations for increasing confidence in delivery

Our recommendations are listed below. We have also identified in brackets the parties we believe will be best placed to lead in each case, and grouped these in terms of those which NR can implement internally, those which NR should lead, and those which other parties will need to lead.

Network Rail implementation

1. **Develop high-level resource loaded master plans, and link to overall resource planning (NR)**

We recommend the further development of a high-level, comprehensive resource forecasting master plan, with information shared with the supply chain. Although there is an existing resource forecast “master plan”, this does not appear to be underpinned by a robust process to ensure that it is comprehensive and maintained as current. In order to generate supplier confidence in use of these forecasts, it is important to distinguish between those elements of the programme which are committed and those which are still in development. It is also important to have transparent change control.

2. **Consider developing a more effective capability maturity model and action plan specifically focused on enhancements (NR/suppliers)**

We recommend that a further review is undertaken of the use of the capability maturity model, and the development and delivery of associated action plans in order to ensure that this addresses specifically the priority requirements for Network Rail’s enhancement programme. The model could also be adapted for use by the wider rail industry (to be discussed further with NR / ORR).

Network Rail lead with support from other parties

3. **Consider re-phasing of planned delivery (NR/funders)**

Network Rail should consider options to re-phase its planned delivery of some enhancements until later in the control period in order to generate a more gradual ramp-up in demand. As part of this, consideration should be given to prioritisation of outputs to be delivered, as well as external dependencies such as rolling stock provision. Given the extent of the uncertainty, it may also be desirable for funders to consider whether some enhancement outputs should also be phased into CP5, although it will be sensible to at least commence delivery of these within CP4.

4. Establish in conjunction with suppliers and trade associations, priorities for skills development and develop an industry based action plan to help grow the skills (NR and suppliers)

There are a number of areas where the existing skills base of Network Rail and the supply chain are inadequate to meet the growing demands. Although the Rail Industry Skills Council exists to provide a mechanism to review and promote required development, there are views that this is not yet operating as effectively as it could to sponsor the development of the resource base. We recommend that NR, together with its suppliers and the various trade organisations, sets out an explicit set of skills development priorities, and sponsors actions which will help to grow these skills.

5. Devise and implement an effective monitoring system geared to achieving commitments given in the SBP (NR/ORR)

It is important for all stakeholders that there is effective monitoring of NR's progress in delivering its SBP commitments. The primary monitoring and enforcement responsibility is with ORR, but many parties will wish to have visibility and confidence in progress. We recommend that monitoring should cover:

- development status and progress against plans
- effectiveness of project development work and value generated
- efficiency of development and delivery
- expected dates for physical completion
- changes in network capability and HLOS outputs
- NR's progress in developing its own capability.

We note that Network Rail has well developed internal monitoring processes, and it will be sensible to build upon these where relevant.

6. Seek the establishment of some form of cross-industry collaboration between clients of major programmes (NR/funders/OGC)

With the unprecedented number of major rail and other infrastructure projects planned for the next five to ten years, as mentioned in Section 5.9 above, and all competing for scarce resources, there is an opportunity and need for the project clients to collaborate, for example in:

- procuring and developing the required resources
- managing interactions and conflicts between projects (eg to coordinate logistics, share supplies, deal with spoil and minimise congestion)

- communications to ensure that the public at large appreciate and takes pride in the enormous improvements being planned and implemented, and is therefore more tolerant of the temporary inconveniences caused by the works.

We understand OGC has been tasked to take the lead in establishing and supporting a single forum to co-ordinate major infrastructure construction activity. We recommend that this initiative be reviewed and supported. However, it may also be beneficial for NR, if it is not already doing so, to establish contact with the other project clients to pursue mutually beneficial collaboration.

For other parties to lead

7. Develop and implement a change control process for the SBP enhancements, covering all significant changes from whatever source (ORR/NR)

The change control process should cover identifying, evaluating, agreeing and managing changes to the agreed SBP enhancements, so that their implications are understood before action is taken to implement or respond to them. The reasons for changes may include:

- changes in Government policy or available funding
- greater than anticipated rate of inflation
- realisation that proposed enhancements may be substantially more costly than expected, may not be feasible, or not have the desired effects
- slower than planned progress due to resource shortages or capacity limitations.

We recognise that ORR is already developing a change control process under the Regulatory Framework.

8. Set targets for development of all HLOS projects so as to increase certainty and maximise generation of value (ORR/NR)

Early further development of the HLOS enhancements will help funders and users to gain greater clarity and certainty of the schedule for delivery. We recommend that targets are set to provide focus on progressing this activity. We recommend that an initial target date is set to complete development of all HLOS projects to GRIP stage 2, perhaps linked to publication of the March 2009 Business Plan. A series of target dates may be more appropriate for achievement of GRIP 4, given external constraints.

9. Review the supervisory roles of ORR, DfT and Transport Scotland (ORR/Funders)

We recommend that the supervisory roles of ORR, DfT and Transport Scotland be reviewed, with a view to achieve greater clarity, synergy and efficiency.

Finally, we have an over-arching recommendation

- 10. Develop and implement an overall Capability Development programme to provide more focused and concerted action to implement the priority measures to increase capability to the level needed for maximizing confidence in successful delivery of the enhancements programme (NR/ORR)**

We suggest that all the initiatives current and planned are prioritised and then brought together within a single change programme, specifically focused on the capabilities needed for planned enhancements. Ideally that programme should include the contributions of the other key players in delivering the enhancements programme. Without compromising the other players' respective roles, this gives NR the opportunity to exercise real leadership across the UK main-line rail industry in delivery of the enhancement programme.

It will be for the various parties to consider these recommendations and agree a suitable way forward and appropriate accountabilities. This may need to include further in-depth analysis of the current position following the publication of the SBP refresh.

Abbreviations

ACE	Association for Consulting and Engineering
APM	Association for Project Management
ATOC	Association of Train Operating Companies
BNS	Birmingham New Street
CECA	Civil Engineering Contractors Association
CP	Control Period
CMM	Capability Maturity Model
DfT	Department for Transport
E&P	Electrification and Plant
FOC	Freight Operating Company
FY	Financial Year
GRIP	Guide to Railway Investment Projects
HLOS	High Level Output Statement
IEP	Intercity Express Programme
ICE	Institution of Civil Engineers
II	Infrastructure Investment Directorate
NR	Network Rail
NRDF	Network Rail Discretionary Fund
NSIP	National Stations Improvement Programme
OGC	Office of Government Commerce
OLE	Overhead Line Electrification
ORR	Office of Rail Regulation
PTE	Passenger Transport Executive
R&D	Research and Development
RAMP	Risk Analysis and Management of Projects
RIA	Railway Industry Association
S&C	Switches and Crossings
SBP	Strategic Business Plan
SDG	Steer Davies Gleave
SOFA	Statement Of Funds Available
SOP	Sales and Operations Planning
TIF	Transport Innovation Fund
TOC	Train Operating Company
TS	Transport Scotland
TWA	Transport and Works Act
UK	United Kingdom

Appendix 1

Terms of reference

Background

Network Rail (NR) submitted its Strategic Business Plan (SBP) for Control Period 4 (2009-2014) in October 2007, and is due to submit a refresh by 3 April 2008. This forms a key input to the overall CP4 Access Charges Review process. Having published its preliminary SBP Assessment in February, ORR will publish a Draft Determination in June 2008.

A key consideration will be whether the increased volume of enhancements can be delivered successfully to provide the required outcomes taking into account the concurrent substantial maintenance and renewals programme. The ORR has already satisfied itself that, if the projects are completed as planned, the outcomes should be achievable. The key issue therefore is whether NR has the capability needed for the successful delivery of the enhancement programme, or, if not, what it needs to do to establish that capability.

The ORR requires assistance to make this assessment. Accordingly it has invited the Nichols Group to carry out a short review. It is anticipated that this might lead to a more comprehensive Capability Review.

Scope of short review

The short review will:

1. Consider the Strategic Business Plan and supporting information on its deliverability provided by NR
2. Comment on NR's capability to deliver the enhancements programme
3. Propose the scope and terms of reference for a more comprehensive review of NR's capability, if that is thought necessary.

Some key issues

The following issues will be given preliminary consideration in the limited time available for the short review:

- levels of development and planned timing of the proposed enhancements

- NR's own assessment of deliverability and associated risks including safety aspects and mitigation measures
- progress previously achieved against plan in delivering enhancements
- competing demand from other programmes, both within and outside NR
- dependencies on external programmes and mechanisms to manage these
- NR's plans for further developing its capability
- opportunities and challenges associated with planned improvements in efficiency.

Constraints

Timing: The short review must be completed and the report submitted to the ORR by 3 April 2008.

Cost: The budget for the short review is limited to [].

Information: As NR is shortly to submit its updated plan, it is assumed that it will not be acceptable to request a significant amount of additional information: instead, maximum use will be made of information already supplied to the ORR.

Deliverables

At the completion of the review the results will be given to the ORR in the form of a presentation and a written report.

Appendix 2

Review team

Mike Nichols

Chairman & Chief Executive of the Nichols Group, which specialises in the management of large-scale, complex capital projects and programmes, and business change initiatives.

He has extensive experience in planning, directing and advising on major projects in the transport, telecommunications and power industries. In particular, he directed a management contract for the first phase of the Hong Kong Mass Transit Railway and project managed the initial stage of the Docklands Light Railway, both completed on time and within budget.

In July 2006, the Secretary of State for Transport commissioned Mike to review the Highways Agency approach to cost estimating and project management. His report, Review of the Highway Agency's Major Roads Programme, was published in March 2007.

Mike has launched and led development of new approaches in project, programme and risk management. These include RAMP (Risk Analysis and Management of Projects) recommended in the Treasury's 'Green Book', and STRATrisk, a new initiative for dealing with strategic risks at Board level published by Thomas Telford Limited.

Mike has a degree in Economics, is a Fellow of the Institution of Civil Engineers and an Honorary Fellow of the Institute of Actuaries. He is Chairman of the Association for Project Management, Board Member of the Major Projects Association and Member of the Standards Policy and Strategy Committee of the British Standards Institute.

Peter Hansford

Peter is an Executive Director of the Nichols Group, with responsibility for government and regional business, in addition to leading and contributing to strategic consulting assignments.

A specialist in project and programme management, he was Executive Director Infrastructure at the Strategic Rail Authority from 2000 to 2003. His career spanning over 30 years has included highways and railways in both the UK and Asia.

Peter has carried out strategic reviews in various industry sectors, including in 2004 the review into cost overruns of the Scottish Parliament Building. He was a member of Mike Nichols' review team for the Highways Agency's Major Roads Programme.

Peter is a Fellow of the Institution of Civil Engineers and a Fellow of the Association for Project Management. He is a Vice President of the Institution of Civil Engineers and a Board Member of the Engineering Council UK.

Paul Wiseman

Paul is a Senior Consultant of the Nichols Group. He is a sponsorship, programme management and change management expert. His wide ranging experience in the rail sector encompasses business efficiency improvement, organisational restructuring, process improvement, business development, running a national project office, developing network strategy, asset management and investment sponsorship.

Paul has spent 27 years in the rail industry, initially as permanent way engineer specialising in technical development and managing internal consultancy. As Head of the Network Rail National Programme Control Office he was responsible for developing the GRIP process, and more recently was Head of Investment Efficiency within Network Rail. He has gained a reputation in the industry for successful delivery in senior project and programme management roles, reporting at Director level, and delivering strategically important business change and investment programmes.

Paul is a Chartered Engineer and a Member of the Institution of Civil Engineers.

Appendix 3

People interviewed

The following is a list of the people that we have interviewed or met as part of this review.

Name	Title	Organisation
John Larkinson	Deputy Director, Access Planning & Performance	Office of Rail Regulation
Bob Linnard	Director Strategy, Rail & National Networks	Department for Transport
Tim Wellburn	Head, Rail Network Management & Freight	Department for Transport
Graham Dalton	Director Projects, Rail & National Networks	Department for Transport
Jonathan Pugh	Head of Rail Regulation and Standards	Transport Scotland
Simon Kirby	Director of Infrastructure Investment	Network Rail
Roger Dickinson	Enhancements Programme Director	Network Rail
Charles Robarts	Head of Business Planning	Network Rail
Rob Carr	ERTMS Programme Director	Network Rail
Tariq Yusuf	Programme Controls Manager	Network Rail
Ian Ballentine	Head of Contracts & Procurement, Infrastructure Investment	Network Rail
Ian Hodgins	Programme Controller, Enhancements	Network Rail
Dave Rayner	Business Planning Manager	Network Rail
George Muir	Director General	ATOC
Jeremy Candfield	Director General	Railway Industry Association



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