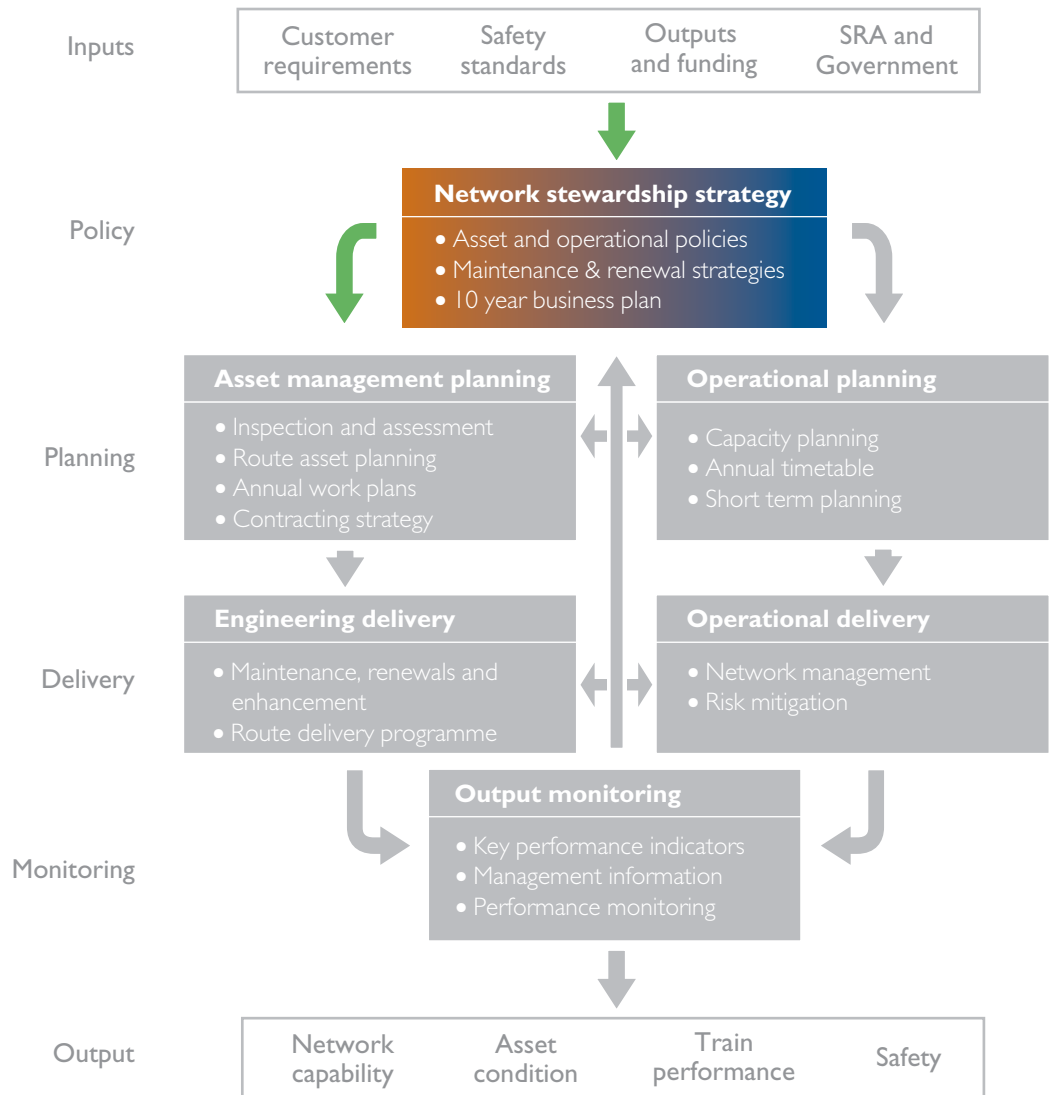


Section 3

Network stewardship strategy



Objective

The aim of our network stewardship strategy is to provide a robust and consistent framework for determining the actions that we need to take to deliver a safe, reliable and efficient rail infrastructure. In determining these actions there are two dimensions that we must consider:

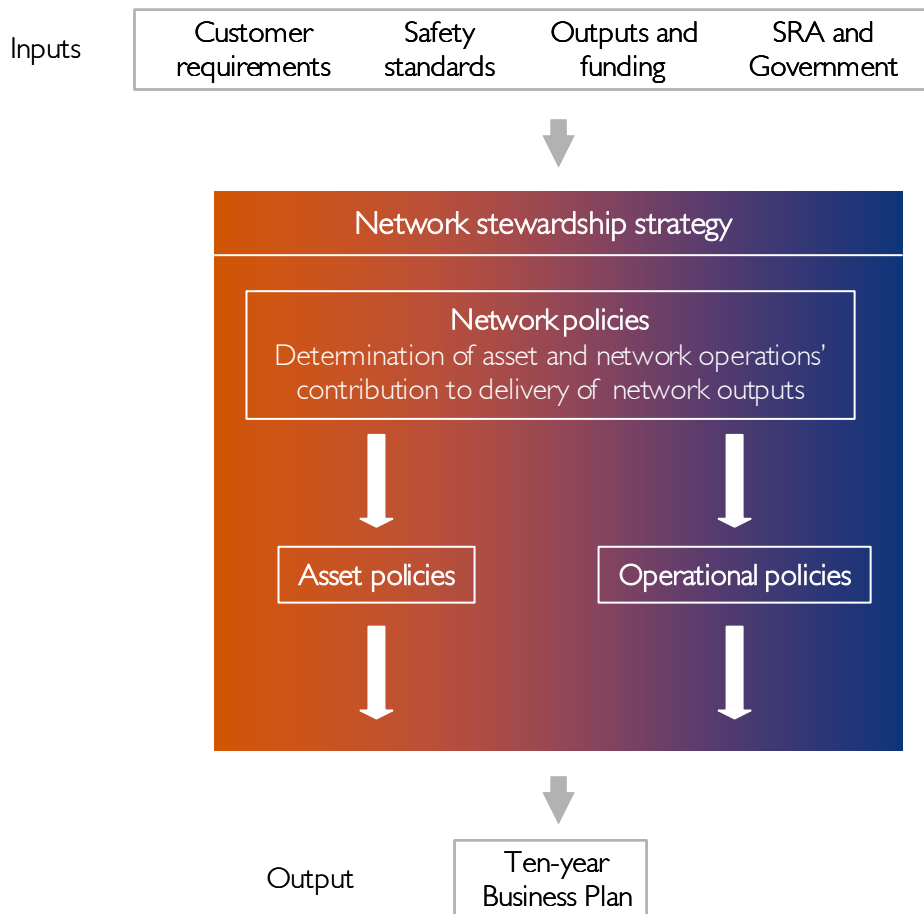
- **train service delivery** – the translation of multiple train operators' requirements into a timetable that can be delivered safely, reliably and consistently, whilst allowing appropriate access to the network for maintenance, renewal and asset enhancement; and
- **asset condition** – the achievement of optimum life-cycle costs, ensuring that asset condition and reliability can be maintained for current and future timetable requirements in the most cost effective manner.

The outcome of this process is a business plan that defines the expenditure, volumes and outputs associated with the asset management plans for the next ten years. Also produced are asset management and operational policies that support the delivery of this plan.

Approach

The components of the development of an effective network stewardship strategy are shown below.

Figure 3.1 Network stewardship strategy



In this section we identify the key activities required to develop, and ensure the delivery of, a robust ten-year business plan. The key activities are as follows:

- **business inputs** – the identification of the business and safety drivers that determine the expected operational, performance and safety characteristics of the network;
- **network policies** – assessing the impact of the business inputs and ensuring that the relationship between drivers and policies, both for asset stewardship and network operations, is clearly understood;
- **asset policies** – the development of asset management policies that deliver the required asset reliability and safety performance;
- **operational policies** – determining the most appropriate framework for the development and delivery of effective train timetables, working in close cooperation with our industry partners and ensuring that the constraints are challenged where these are sub-optimal for the industry as a whole; and
- **ten-year business plan** – a key output of the above is a ten-year plan that describes the activities, and consequential costs, required to deliver the agreed network outputs.

Over the next 12 months we will continue to progress a number of key initiatives aimed at improving the production and robustness of our business plan. This is a challenging programme and includes:

- improving our ability to assess key business drivers and the development of a prioritisation framework for operational, maintenance and renewal expenditure that optimises the delivery of the required network outputs;
- the development of individual route strategies to support the delivery of these outputs, supported by targeted asset and operational policies;
- overhauling our business planning processes in line with the new functional structure;
- continuing with the development of a suite of asset decision support tools, supported by robust unit cost data, to improve the consideration of different business scenarios;
- a more holistic approach to the development and prioritisation of performance initiatives, that reflects the complex interactions between asset stewardship and network operations;
- ongoing support to the SRA in its programme of work to develop Route Utilisation Strategies;
- implementing a new process for standards development ensuring that costs deliver commensurate benefits and the elimination of those which are inappropriate or contradictory;
- building on our work with the SRA, updating and modernising the train services and engineering access planning rules; and
- a critical review of the timetabling processes.

Business inputs

A comprehensive understanding of the drivers that determine the operational, performance and safety characteristics of the network is essential to the production of a robust business plan. There are four key business drivers that we must consider when developing our business plans:

- the requirements of our customers;
- safety standards;
- outputs targets and funding; and
- SRA and Government objectives.

Customer requirements

Understanding our customers' needs is key to the success of our business. Optimising capacity usage is clearly a challenge, especially when attempting to reconcile different needs and operating patterns. Passenger, and some freight, operators require regular and reliable timetabled services. Other freight operators require maximum timetable flexibility, with high reliability levels, in order to meet their customers' needs for sophisticated just-in-time operations, which are essential if rail is to compete with the road freight sector. At the same time, greater volumes of maintenance and renewal activity are increasing pressure for access to maintain the network. A balance needs to be struck between these competing demands, through planning, enhanced cooperation and improved asset management.

Our understanding of demand in the passenger markets is based on observations of current travel patterns and an assessment of how those patterns change with movements in the economy and the costs, journey times, reliability and congestion of alternative modes of transport. We use demand forecasting techniques developed jointly with industry partners in conjunction with the high-level forecasts published by the SRA. Similarly, freight demand growth is determined by understanding the comparative advantages of haulage by road and rail, the expected performance of the markets served by rail, changes in the geographical distribution of industries and levels of cross-channel traffic. Demand patterns will be driven by cost, the level of SRA subsidy and the level and pattern of imports. Our forecasts are developed in close collaboration with the SRA.

Our forecasts of passenger and freight demand feed into a number of our activities including route capacity planning, operational planning, and asset stewardship planning. Whilst demand forecasting is reasonably accurate, its impact on capacity utilisation, assets and performance is more difficult to predict. This has often resulted in the introduction of new paths that have turned out to have an adverse effect on performance. The process by which we analyse demand and capacity at a route level is described in Section 6. This analytical work enables us to:

- understand how the existing rail network can be most effectively used to meet the reasonable requirements of our customers and funders;
- understand how performance can be improved, through the trade-off between the number of train paths operated and the performance level delivered; and
- ensure appropriate engineering access is available, so that the performance and output level that is required can be delivered.

We use this analysis to support the SRA in its programme of work to develop Route Utilisation Strategies, as described in its Capacity Utilisation Policy documents.

Changes to the number of trains on the network have an impact on our asset stewardship planning because changes in the level of usage affect the rate of degradation of our assets. The introduction of new types of train can also be a major issue through changes in the nature of these degradation relationships. A clear understanding of future traffic patterns is essential to ensure that we understand the delay impact, that we carry out the appropriate degree of maintenance, and that our renewal forecasts reflect the acceleration in asset deterioration that will result from increased usage. This is particularly important where step changes in traffic volumes are involved.

We have identified the key interactions that must be managed to address these issues. We are in the process of identifying a set of modelling tools, some of which are already in place, which will allow us to assess traffic impacts and evaluate alternative options. Over the medium-term, as our understanding improves, this knowledge will feed back into the capacity planning work undertaken with the SRA in order that appropriate decisions can be made to accommodate demand and realign our plans with the strategic objectives of our key stakeholders.

Local output commitments

A major development in our relationship with our customers is the introduction of local output commitments (LOCs). These are expected to come into effect through the introduction of a new Part L of the Network Code during 2004. The LOC process will include a commitment to deliver a specific level of performance output for each franchised train operator (expressed as minutes delay per 100-train km) and will be based upon the anticipated incremental changes in performance from the previous year. This will take account of the initiatives that are undertaken to improve performance on the network.

The individual train operators' LOCs will have a tolerance level, currently anticipated to be 25% above a budgeted delay minutes target. If we breach the annual tolerance level, the train operator can claim for their relevant losses over and above the Schedule 8 payments we make to them. The detail of our improvement initiatives and the effect on performance, including timescale and magnitude (in minutes), form the plans that are shared with operators. This will give unprecedented levels of transparency of our plans and provide the opportunity for a greater degree of scrutiny by train operators. However, it is recognised that this is a new initiative and the process by which these plans are developed will continue to be improved in the next year.

It is anticipated that the commitment will be developed eventually to form a three-year obligation (with year two and three being subject to change only with good reason). It should be recognised, however, that the longer-term projections in the initial LOCs will be more likely to change, as our understanding and ability to forecast performance at customer level is improved. Following submission of the final LOCs, train operators will have the opportunity to appeal, either to an industry dispute body or directly to the Regulator. The Regulator will judge appeals against detailed criteria, which are currently being developed. A 'shadow run' of the impending contractual commitment has been undertaken during 2003/04. This has helped establish the process required to meet the expected contractual obligation and has proved useful in addressing some of the new requirements and timescales the business will need to meet. The timescale for the finalisation of the targets for 2004/05 has not yet been confirmed.

This is a relatively new process, and whilst this shadow run has helped to establish relevant processes to meet that obligation, it will take time to evolve into a robust three-year projection. The opportunity to target improvements from a train operator's perspective will also take time to develop and implement. The ability to influence performance plans for 2004/05 is limited, primarily related to operational initiatives. Significant modifications to maintenance plans and influencing renewal and enhancement activities are unlikely to deliver benefits until 2005/06 and 2006/07 respectively. The route plans being produced will give further visibility to the longer-term improvement programmes relating to the individual routes. The Regulator has identified four specific operators who, in his opinion, require a specific remedial plan. Work is underway to explore opportunities to meet this requirement.

Safety standards

We are committed to securing the proper control of risks to the health and safety of employees, passengers and others who might be affected by the operation of the railway. In conjunction with our safety regulator, the Health and Safety Executive (through Her Majesty's Railway Inspectorate), we have targeted particular areas for improvement over the next three years. These include:

- measures to reduce the number of signals passed at danger;
- improving the arrangements for managing contractors and reducing the risks to workers from trackside working;
- preventing vandalism, tackling the widespread problem of trespassing and reducing the numbers of assaults on rail workers; and
- improving recognition and understanding of occupational health issues.

The Railway Group Safety Plan is an annually reviewed over-arching industry plan and we make a significant contribution towards its delivery. The 2004/05 plan aims to achieve objectives across five key areas:

- risk management;
- catastrophic risk;
- passenger safety and security;
- public safety; and
- workforce safety.

Outputs and funding

The Regulator is responsible for regulating the stewardship of the national rail network, the relationship between train operators and the network operator and other key aspects of rail service provision. One of the key responsibilities of the Regulator is to specify the required train performance, asset condition and route capability measures, and determine the level of access charges that we can charge train operators to fund the associated operational, maintenance and renewal activities to deliver these outputs.

As a consequence of the cost of operating, maintaining and renewing the rail infrastructure exceeding the assumptions underlying the last periodic review, the Regulator initiated an interim review of access charges in late 2002.

This required us to produce our projections of the cost of delivering the network capability, asset serviceability, asset condition, and the trajectory for operational performance put forward by Railtrack in its 2002 Network Management Statement (broadly envisaging a return to pre-Hatfield levels of delay minutes by 2006). Our 2003 plan (updated in June in line with our efficiency proposals) provided this information. Following further cost submissions, in December 2003 the Regulator published his final conclusions on the access charge review for the five years commencing April 2004. Within this, the Regulator set out his expectations with regard to the network outputs, and his targets for improvements in operational performance.

Our plan is consistent with all of the asset stewardship output measures set by the Regulator. These include measures of network capability (such as line-speed and loading gauge) and measures of asset condition (e.g. the number of broken rails and the number of asset failures causing significant train delays). Many of these measures are defined in terms of avoiding any deterioration in the average condition of the assets, but some, notably broken rails, set targets for improvements in condition. The specific measures are discussed in more detail in the relevant asset sections of Section 9.

Whilst we have sought to develop plans that will deliver the train service reliability target, this remains extremely challenging. Our plans for each of the key business processes described in Section 2 are critical to success in this area, with the main elements of these plans brought together in Section 10.

SRA and Government

The Government's ten-year Transport Plan, as subsequently amplified through the SRA's Strategic Plan, sets out its objectives for the industry. The SRA is our major funder, either directly, or indirectly through access charges paid by operators that are subsidised by the SRA.

It is also responsible for:

- providing strategic direction and leadership to the railway industry;
- setting and managing passenger franchises and freight grants;
- developing and sponsoring major infrastructure projects; and
- some aspects of customer protection.

The SRA has emphasised that its role as funder and strategic specifier goes hand-in-hand with private sector management and risk taking, and that Network Rail operates at arm's length from the SRA under an incentive scheme designed to reflect private sector practices.

The SRA Strategic Plan outlines its goals over a ten-year period:

- growth in passenger and freight traffic;
- reducing overcrowding on services within the London area to meet SRA's standards; and
- performance, in the form of train service punctuality and reliability, is to be improved.

The SRA's Strategic Plan is normally updated in January of each year, but will be published later in 2004 to allow it to align with and reflect the outcome of the Government's spending review. Our business plan takes account of the SRA's 2003 Plan, and also of discussions with the SRA during the course of the interim review.

Network stewardship policies

Having identified the key business drivers, a strategy must be developed that provides an appropriate economic solution to the delivery of the required network outputs. This strategy provides a framework for the production of asset and operational policies, whose implementation underpins the delivery of these outputs. To do this we need to understand the complex relationship that exists between our infrastructure and the development and operation of a safe and reliable network. It is self-evident that improvements in asset reliability will have an impact on train service delivery and reliability. However, our proposed initiatives can impact upon multiple network outputs. For example, improved network management and train regulation will bring about a more reliable train service and, as a consequence, contribute to an improvement in overall safety on the network. Whilst some of these interactions are understood, for others the relationship is less clear.

The need to deliver safe, significant and sustainable improvements in train service reliability underpins all aspects of our business plan and is the focus of attention of many within our company. This particular challenge highlights the importance of understanding the interaction between asset management and network operation. The complexity of the rail network, the differing needs of industry partners, and the inter-relationships between the number of train paths operated and train performance creates a very significant challenge for an industry faced with the need to improve performance. Our current approach seeks to recognise the factors that contribute to poor train performance, address those that are directly under our control and lead the debate with our partners where a cross-industry solution is called for. The key factors that underpin the delivery of a reliable train service are asset reliability, a robust timetable and effective network management.

Addressing infrastructure reliability is only one part of the equation. Equally important is the robustness of the train timetable and our ability to deliver it. The substantial growth in traffic since privatisation has brought with it a performance penalty. When any network is operating close to capacity, relatively small increases in traffic have a disproportionate impact upon performance. This is particularly true following an incident such as a points failure or train breakdown. The knock-on effect on other services can prevent an over-stretched network from recovering rapidly. Achieving improvements in train performance requires clearly focused actions to ensure that these factors are addressed in a cost-effective manner and that reflects their relative contribution to the problem. Improved asset reliability provides a major lever for improving performance and supports our objective of improving safety. However, significant improvements in asset reliability take time to deliver, even when focused on those assets that are critical to the performance of the network. Inevitably, it is the assets that are most important to train reliability that are located on the busiest parts of the network. Safe and economic access for renewal and maintenance of these assets can often only be achieved by closing the route to traffic. This can be unpopular with our customers and their passengers but is vital to sustainable train performance and must increasingly be recognised through Rules of the Route reviews.

Our asset and network policies have been developed to meet these challenges. The performance equation is highly complex and our understanding of the relationship between activities and outputs is still developing. This means that we are not yet in a position to target accurately the contribution to performance improvements from individual initiatives. We are also not yet able to ensure that we have the optimum balance between the relative contributions of improvements in asset reliability and network operations. However, addressing the key issues provides us with an early opportunity to make progress, whilst we develop the tools that enable optimised plans to be produced.

Sections 6 and 7 provide more information on the content of individual initiatives. Section 10 provides details of the scale and profile of the improvements expected, with Section 8 outlining our plans to improve our ability to monitor the deliverables from the individual plans and improve future forecasting.

Asset policies

A robust infrastructure is central to the operation of the network. Its reliability underpins the effective delivery of the train timetable. It allows the safe operation of the train services, and, when operated on an optimised whole-life cost basis, ensures that future timetables can be delivered in a cost-effective manner. The development of effective asset policies is a complex task, particularly given the size of the network and the long life of many of the assets. For example, financial constraints over a number of years led to many components being selected on the basis of the initial capital cost rather than their whole-life cost. Wholesale replacement of such components cannot be delivered instantly, a problem exacerbated by the interaction of many assets on the network. The integration of new and existing technologies can also be complex given the extremely varied nature of the network. This means that bespoke, rather than generic, solutions are often required.

Our approach to asset policies is based on an integrated approach for delivering a safe, reliable and affordable railway, by ensuring that:

- there is a clear and unified approach to the development of asset policies;
- we have accurate and comprehensive information about the assets and knowledge of how the assets are performing;
- we develop decision support tools that will assist in making objective decisions; and
- we understand our resource constraints and future demands on the network, as well as the outputs we are trying to achieve.

The policies are dynamic, reflecting changes in the business drivers and technologies with time. The existing policy/standard/specification/work instruction hierarchy will ensure effective implementation is maintained. Asset policies have been developed for all asset categories and these are discussed further in the relevant parts of Section 9. Each policy covers inspection, maintenance, renewal and enhancement. During the next 12 months, as we continue to explore opportunities to optimise the delivery of our network outputs through appropriate prioritisation, our revised Network Stewardship Criteria will provide a framework in support of the identification of any revisions to our existing policies.

Asset maintenance and renewal strategies

Our asset policies are underpinned by maintenance and renewal strategies that set out how the asset policies should be delivered. The activities that result from the implementation of these strategies will form the basis of our business plans. Our strategies are based on a set of ten principles, which are that the company will:

- be responsible for asset stewardship decisions;
- deliver clear asset engineering policies, standards, and specifications;
- directly manage core maintenance and continue to contract out renewals;
- own asset information;
- be able to demonstrate the cost-effectiveness of maintenance and renewals;
- lead industry research and development;
- own the examination of the network;
- own work prioritisation decisions and the resulting work plans;
- own all engineering access to the network and manage possessions; and

- be accountable for developing the long-term view of the people and capability required.

The decision to manage directly core maintenance represents a key development in these principles. The rationale for this decision is provided in Section 4.

In line with these principles we are focusing upon:

- the adoption of an integrated approach to maintenance and renewals ensuring that we develop plans that deliver whole life cost solutions appropriate to the available levels of funding;
- a consistent prioritisation of maintenance and renewals according to condition, performance, current and expected usage, and operational risk;
- continuing the move from a reactive approach to maintenance to one of predict-and-prevent; and
- recognising the need to make available network access and resources to undertake the work safely and efficiently.

Central to the development of asset policies, and hence to the economic delivery of the required network outputs is an understanding of the relationship between activities and outputs, and a robust understanding of the cost of delivering these activities.

Activity/output relationships

We believe long-term activity forecasting is essential for the efficient management of the network in view of the long asset lives and the long lead times involved in making significant changes. We do not as yet have a mature process achieving this. As outlined in the 2003 Technical Plan, we are developing a robust strategic planning process to provide a framework within which specific activity will be identified and prioritised in the short-term. This process is being underpinned by the development of improved decisions support tools (DSTs) for all asset categories, and considerable progress has been made in this area over the last twelve months. However, further work is required to develop, refine and apply the suite of tools to improve the robustness of the forecasts and the relationships between activity and network outputs. In particular, these tools need to be able to be applied at a route level to develop more useful route plans and to improve the robustness of our network-wide plans.

Modelling approaches

Models are used to express the way the asset behaves in terms of the key outputs for which we are accountable and to identify the volumes of work and associated costs required to deliver these outputs. A number of different techniques are used in the production of the long-term forecasts, according to the nature of the assets involved, the extent of understanding of the way in which they degrade and the availability of data on asset type, installation date (age), usage, condition and rates of degradation. These approaches can be broadly categorised as follows:

- **condition** – forecasts are based on modelling the rate of degradation of assets with thresholds determining the timing of intervention, e.g. T-SPA modelling of rail and ballast;
- **life-cycle** – forecasts are based on life-cycle cost modelling using alternative intervention cycles;
- **service life** – forecasts are based on the average service life of an asset, defined in cumulative tonnage or some other measure of usage, with renewal predicted when this life is reached;
- **age (profile)** – forecasts are based on an assumed average asset service life, defined in years, where age is treated as a proxy for condition;

- **age (steady state)** – forecasts are again based on assumed average asset service life but there is little reliable data on the current age profile, so a “steady state” renewal rate is derived from the assumed asset life, e.g. a 50-year asset life implies 2% renewal per annum;
- **cost profile** – forecasts are based on previous patterns of expenditure where specific activity is difficult to forecast, and are therefore not underpinned by volume and unit cost detail; and
- **expert assessment** – forecasts based on the expert judgement of the responsible engineering professionals using the best available information, research and expert opinion.

These approaches are not mutually exclusive, and the forecasts in most asset categories involve elements of more than one of these methods. In some areas the core forecast process has been cross-checked using the output of another method. The results of complex models are always subject to expert review before being incorporated in the plan forecasts. Section 9 contains details of the tools in use or development for each of the asset categories.

Interventions

Each process involves the definition of an intervention threshold: the point at which a maintenance or renewal activity will take place. Depending on the approach used, this may be a defined condition measurement, a maximum cumulative tonnage or a critical age. It is important to note that the intervention thresholds specified for the purposes of producing long-term strategic forecasts need not be the same as the rules applied on the ground in deciding whether and when specific assets should be replaced. For example, the fact that some asset models use age as the renewal criterion does not necessarily mean that individual assets are replaced purely on grounds of age, merely that age is the best available proxy for estimating the volume of assets likely to need replacement on grounds of condition. The strategic models identify the expected total volumes of activity and cost, not the individual assets that will need to be replaced.

Information requirements

As described above, our modelling tools require a range of information: population, asset type, condition, date installed etc. Detailed information about the level of traffic is of most importance for forecasting track maintenance and renewal requirements, where usage is a key driver of the degradation of track components. For other assets, the level of traffic has a more limited impact on degradation. A significant programme of work, described in Section 4 and within the plans by asset type Section 9, is in progress to ensure that our strategies are founded upon adequate knowledge of our assets.

Activity costs

Cost information is also important when seeking to optimise maintenance and renewal strategies. In the past, the company has suffered from a lack of robust cost and volume data for its maintenance and renewal activities. This was primarily due to inconsistencies in the definitions for the relevant units of volume, and the differing treatment of particular aspects of costs between the delivery units and our contractors. This has hindered the measurement and assessment of efficiency and cost control and has adversely affected the accuracy of previous cost forecasting.

Our initiative to implement the collection and maintenance of robust and comprehensive cost data is driven by four main objectives:

- facilitating whole-life cost decision making for asset maintenance and renewal;
- providing a means for assessing the scope for efficiency improvements and measuring progress in achieving them;

- improving control over work volumes and costs; and
- supporting the benchmarking of the delivery units.

A unit cost framework for each asset is being defined. These frameworks define the units of activity to be measured and the processes for allocating costs to the activities; this is designed to ensure that unit costs are measured throughout the company on a consistent basis.

The unit cost processes were first introduced into the track renewals programme as there was good visibility of the data and the cost impact was significant. Unit cost processes have since been implemented into the structures, signalling, and maintenance programmes, and are currently being tested on electrification and plant. An operational property unit cost framework will be developed over the next six months. Once the frameworks have been agreed and the data collection problems resolved these unit cost frameworks are embedded into the monthly business reporting and business planning processes. At present, data collection is primarily through manual means, with varying degrees of quality. The systemisation of the data collecting processes will continue, covering all assets over the next 12 to 18 months. The use of MIMS and the new investment management system will progressively improve data quality.

The ability to compare costs across the business is an essential element of our strategy for cost reduction. A regional benchmarking exercise for track renewals has recently been completed. The analysis focused on identifying the underlying cost drivers that cause variances in the unit costs for plain line renewals across the business. This analysis has provided a basis for the development of benchmark unit costs for plain line renewals. Where appropriate, it is our intention to develop this initiative to cover other activities.

Engineering standards

As far as practicable, we will ensure that the stewardship of the asset base is supported by sufficient coverage of company standards and where appropriate, internal business process documents. A principle of future standards and procedures is that they should not impose costs unless they deliver commensurate benefits. We will move to reduce the number of company standards through a risk managed process, eliminating any that are inappropriate, contradictory, or do not add value. Similarly, we will seek to declassify standards which are clearly internal business processes. All changes will be made in accordance with the change control philosophy that we are developing as part of our specific review of the company standards management system, aimed at improving our company standards and business document framework. This will address identified deficiencies and recognise the impact of proposed European legislation, the importance of safe interface management across the railway systems and improving compliance to standards.

European legislation is increasingly defining the standards that apply to the network. The EU Directive on High Speed, and the associated High Speed Technical Specifications for Interoperability (TSI), came into UK law in 2002. A further EU Directive on Conventional Interoperability is expected to come into UK law late in 2004. It encompasses all rail vehicles and just over half of the rail network, and will also impose significant costs on the company. It should be noted that the cost of future changes in TSIs have not been included within this plan.

Technology

Our technology strategy is directed at solving existing and emerging problems of the railway network and identifying new technologies that improve safety and efficiency. Technology activities that are being pursued have clear objectives, timed deliverables, specific budgets, and well-defined outcomes. These activities are driven by two over-arching objectives:

- to apply technology to eliminate the sources of failure that affect operational performance; and
- to seek out and implement technologies that can be applied to improve service reliability, cost-effectiveness, and safety of the railway.

We have adopted a technology development prioritisation process that systematically identifies programme objectives, deliverables, economic criteria and consistency with our seven strategic objectives. The process also generates an anticipated implementation strategy and benefit stream in order to produce estimates of the net present value. These factors are then taken into account in prioritising the projects. Strategic issues are based on business drivers and include customer satisfaction, regulatory and legislative implications, relationships to other activities, alternative actions and any anticipated constraints on implementation.

Current initiatives

Our current focus is on technologies to support our performance improvement programme. We have been improving the effectiveness of pantograph, hot axle box, overhead line and wheel irregularity monitoring systems, as well as exploring new technologies in these areas. We are also producing a remote condition monitoring policy to embrace the business case justification for points, power supplies, weather and bridge strike systems. The “Engineers Workbench” concept, which integrates the whole spectrum of monitoring systems for multi-user presentation, has been successfully trialled on the East Coast Main Line and the case for national rollout is being prepared.

Systems authorities

We recognise that the railway is a complex system, where the infrastructure and trains must work in harmony to achieve high performance and cost efficiency. We work through the cross-industry system interface committees to understand the various interfaces, with the key interfaces being wheel-to-rail, train and signalling control and train-to-infrastructure gauge clearance.

In the area of wheel-to-rail interface, we have developed world leading expertise in understanding vehicle dynamics and track geometry interactions, the causes of rolling contact fatigue (RCF) and wheel and rail profiles. We have worked closely in joint studies with the train operators, led by the Wheel Rail Interface System Authority (WRISA). These studies have produced knowledgeable and informative reports, with this knowledge transferred to our track engineers to ensure that appropriate maintenance actions are taken to minimise RCF generation. We have identified track geometry features that are likely to cause poor ride quality and established corrective actions such as grinding and lubrication. The UK is now acknowledged as the leading source of expertise in this area.

Operational policies

Whilst reliable infrastructure can be considered as a pre-requisite to the delivery of the desired level of train performance, it provides only part of the solution. The complete solution requires all the factors that can influence operational performance to be addressed.

As a consequence our operational policies are developed to cover three key areas:

- operational planning policies – to ensure the production of a robust timetable that provides a balance between demands for access for train services and for engineering works;
- network management policies – to deliver the timetable in real time as effectively as possible; and
- the risk mitigation policies – to minimise the impact of external factors on the operation of the network.

Operational planning is the process that translates customer access requirements into plans for the provision of safe and reliable train paths. This leads ultimately to the detailed timetable used by front-line staff to deliver the real-time operation of the railway. We are seeking significant improvements in the planning processes through initiatives targeted at short, medium and long-term planning. Our work with the SRA is targeted at ensuring that future timetables make the best use of the available capacity. We are working with the industry to update and modernise the Rules of the Plan and Rules of the Route. These initiatives are developed further in Section 6.

Network management is the real-time process by which we monitor and control the movement of trains on our infrastructure. The primary objective is to maximise the delivery of services in accordance with the timetable. Our strategy here is to ensure that our front line staff have the skills and expertise necessary; that our processes, particularly train regulation, are optimised and that we are exploiting the opportunities that changes in technology can bring in support of our teams and processes.

Operational performance can be significantly affected by external factors that are not within our control. One of the key aspects of delivering a safe and reliable rail service is to ensure that we identify the key external causes of delay and disruption and take appropriate action to mitigate these risks. This includes the management of factors such as:

- weather and seasonal factors – through improved forecasting and seasonal plans; and
- bridge strikes – through initiatives to reduce the number of strikes and to minimise the resultant delays.

The risks and initiatives for mitigation are discussed in further detail in Section 7.

Ten-year business plan

Business planning

Effective asset stewardship requires a planning horizon that reflects the long lives of the assets. It must reflect the lead times associated with identifying specific activities and ensure that the appropriate resources and access to the network are available. A key element of our stewardship strategy is to establish and maintain a business plan that defines the asset and operational policies, and the associated activity volumes and expenditure required to deliver the target outputs. These activities and costs are determined “top down” using the modelling approaches described earlier. The plan is maintained over at least a ten-year time horizon. Within the framework established by the ten-year plan, the annual work planning process identifies the workload in detail over a rolling three-year planning horizon using a “bottom up” approach. This is based upon the application of these policies and the use of specific asset knowledge and is described further in Section 4.

The objectives of the ten-year plan are to:

- define the expenditure, volumes and outputs associated with the ten-year infrastructure asset management plans;
- provide the baseline for future funding;
- provide the basis for efficient medium and long-term asset management planning; and
- provide a framework for the review of alternative policy options or decision scenarios to identify potential asset and route trade-offs.

The development of robust long-term maintenance and renewal plans necessitates an understanding of how assets degrade and what causes this degradation. It is important to recognise that the relationships between inputs (in the form of activity undertaken) and outputs (asset condition and serviceability) are complex. As described earlier, our ability to forecast accurately the effect of changes in activity is limited. The actual level of any specific asset measure is a function not just of the volume of maintenance and renewal activity, but of how accurately it is targeted, how well it is carried out, and of how the assets are degrading as a result of usage and other factors.

The overall impact on some outputs will be a complex function of a range of activities, and the relationships between them may change over time. For example, the number of broken rails is affected by track renewals, rail grinding, proper management of rolling stock wheels and other factors. Similarly, signal failures are associated with track circuits where the condition of the track is the root-cause, and hence it is the condition of track rather than signalling renewal that drives the output. It is therefore inevitable that there is a degree of expert engineering judgment involved in assessing what activity is required to meet a target and/or what quality of output will be delivered by a specified amount of work. Few of the output forecasts are as a direct result of formulaic models.

We have made considerable progress since the publication of the 2003 Business Plan in terms of understanding the limitations of our existing planning processes and prioritising our improvement agenda. However, this period has coincided with a phase of intense analysis and debate about the required outputs and funding. Work on the interim review has diverted resources that under normal circumstances would have been allocated to improving the planning processes, and the limited time available following the Regulator’s final determination has been insufficient to develop a fully robust ten-year plan.

In addition, and as a direct consequence of the interim review process, the activity and expenditure projections vary considerably from those published in our 2003 plan. Awareness of the interim review process and of the adjustments made to that plan is necessary to understand the context within which this year's plan has been developed. In particular, our 2003 plan highlighted a number of areas where substantial further work was required, including efficiency, deliverability, outputs and backlog, and these issues have been progressed through the interim review process.

2003 Business Plan and the interim review

Our 2003 plan, published last March, set out the cost of meeting our contractual commitments while delivering the assumed level of train performance, network reliability and condition. Renewal volumes set out in the plan reflected years of under-investment and were established at a level to return us to steady state levels of renewals within a relatively short number of years. As train performance in the period leading up to the preparation of the plan had continued to deteriorate, renewal volumes were enhanced where a demonstrable impact upon improved train reliability could be expected (primarily by the reduction of temporary speed restrictions and broken rails). We acknowledged the dramatic rise in expenditure over recent years and the fact that current costs were unacceptable and unaffordable in the longer term. In June, we extended the planning horizon to the full ten years and provided details of initiatives that we forecast would deliver substantial cost savings, without compromising the network outputs that we had committed to in our March plan. Cumulative savings were forecast to be around £13 billion over the whole ten years of the plan.

Concerns about the affordability of this plan remained, and in parallel to the development of our efficiency programme we had been working with the ORR and SRA on costing alternative scenarios to those addressed in our March/June plan. These involved varying the network outputs on certain route types, the speed with which we addressed the renewals backlog, and the way in which we access the network to carry out maintenance and renewals work. We also addressed the issues relating to the deliverability of the assumed work volumes, and we adopted a minimum first cost approach to renewals in some areas.

SRA's Network Output Specification

Building on this exercise and the Regulator's third consultation paper, the SRA published a Network Output Specification (NOS). This divided the network into six generic route categories, with outputs reflecting the nature and volume of the traffic on the route. This approach was designed to balance affordability issues with maintaining, where possible, enhanced performance targets on the more heavily used routes. In September we updated our expenditure and output projections as an input to the interim review. These projections were based upon our asset policies developed to support outputs differentiated by route as part of the scenario work carried out during the summer, and updated in line with the NOS. For the first two years of the plan our expenditure forecasts were consistent with ORR proposals. We achieved this primarily by the deferral of renewals that did not have an immediate impact on performance, and scope reductions where the additional work could be carried out at a later date. Years 3 and 4 renewals were at a level proposed by the ORR, with those for the remaining years of the plan based upon asset policies consistent with the NOS.

Interim review of access charges: final conclusions

The Regulator published his final conclusions on our access charges in December 2003. This identified our revenue for the five-year period from 2004/05 to 2008/09 and specified the network outputs that we must deliver over this period. We confirmed our acceptance of the review conclusions in February 2004. The key headlines from the Regulator's conclusions are as follows:

- expenditure assumptions of £22.8 billion (at 2003/04 prices) for OM&R activities over the next control period, approximately £1.1 billion less than our September submission, with the bulk of the expected reduction in the later years;
- the assumed efficiency savings of 8% per annum in first three years and 6% per annum over the next two years, more challenging than our June plan;
- a train delay performance target of 12.3 million minutes in 2004/05, falling to 9.1 million minutes by 2008/09;
- no deterioration in asset condition and capability; and
- a further review of signalling and possession compensation costs in two years.

The Regulator has indicated that although he is generally supportive of differentiating outputs by route, any resulting change in route capability can only be progressed via the existing network change process.

2004 Business Plan

As noted earlier there has been insufficient time following the publication of the Regulator's final conclusions to produce a robust plan covering the full ten years. Nor do we as yet have a fully developed set of tools to ensure our expenditure is wholly optimised. As such, this plan must be seen as transitional, building on the work carried out in support of our September 2003 cost submission for the early years of the plan and providing a platform on which to develop more robust and focused route plans.

For the period 2004/05 to 2006/07, we have developed asset expenditure plans based upon detailed submissions from each business unit. Expenditure information is also presented at a route level. These plans are derived from the Base Plan in our September cost submission. They have been adjusted from our September submission in line with the Regulator's efficiency assumptions and where network capability would otherwise have been compromised on rural and freight only routes. For the remainder of the forthcoming control period (2007/08 and 2008/09), our expenditure plans are also consistent with the September Base Plan, but adjusted to ensure that the overall expenditure during the control period is consistent with the assumptions in the Regulator's final conclusions. These asset expenditure plans are at a network level.

For the final five years of the business plan (i.e. 2009/10 to 2013/14) the expenditure plans are consistent with the September Base Plan, and are presented at network level. These expenditure forecasts are based upon maintaining 2009 asset condition levels. Adjustments have been made to avoid any unrealistic step changes in expenditure between 2008/09 and 2009/10. Given the very challenging efficiency assumptions during the first five years of the plan, annual efficiency assumptions of 2% have been assumed for the remainder of the plan, which is consistent with the levels included in the June 2003 plan.

Although we have not yet completed our analysis of the implications of the final conclusions we are confident of our ability to deliver the required outputs for the following reasons:

- clarity of funding over the next control period enables us to develop more robust plans and also provides a very clear signal throughout the organisation and industry, helping change attitudes and behaviours;
- the flexibility we have to deliver the high level outputs through different combinations of maintenance and renewal activities enables us to manage the impact of any given level of expenditure;
- we will develop criteria for prioritising expenditure between routes and asset categories, taking into account our regulatory and contractual commitments;
- the potential to achieve efficiencies through better control over the actual activities we carry out, in addition to reductions in unit costs; and
- the additional flexibility we have to rescope the West Coast route modernisation project.

Information is provided at the end of this section for expenditure nationally for the ten years to 2014 and by region and asset type for the period from 2004/05 to 2006/07. Following the implementation of the new organisational structure these expenditure and output projections will be reallocated between the new business units.

We are also working closely with ORR, SRA and our customers on a more efficient engineering access strategy. Some elements of the changes that are implied by this approach are reflected in this plan. However, we have not taken into account the full potential impact at this stage. We will continue to develop this as an input to the proposed regulatory review of this issue.

Business planning improvement agenda

Our Network Stewardship Criteria (published in March 2003) set out how we plan and prioritise our stewardship activities within the constraints of the availability of funding, access to the network, supplies of materials and manpower and knowledge of our assets. We stated that, although our current planning process draws together activities from across the company and allows us to consider whether these represent the best use of available resources, we do not believe this process to be sufficiently robust for the longer term. As a consequence, two key tasks were identified: the need for consistency in the application of the business planning process, and the development of a prioritisation framework.

The implementation last year of a templated organisational structure throughout the company has provided us with the opportunity to drive forward consistency of application of the planning process. In conjunction with the implementation of the current organisation, we have also clarified the roles of each function in the business planning process. Over the next few months, our intention is to continue to develop these processes. We intend to ensure all key aspects of the processes are supported by appropriate documentation, and that those parts of the organisation that play an important part in the submission of information are fully briefed on their revised responsibilities.

We have recently commenced the second task, which involves the development of a robust mechanism to determine the priority and timing of different types of work and the parts of the network on which this work will be carried out. This is a complex exercise that necessitates a comprehensive understanding of the factors that influence operational, maintenance and renewal activities and their interrelationship with each other. These include contractual commitments with our customers, our asset condition targets set by the Regulator within his final determination, and safety and other legislation. A means of assessing their relative importance is also required. As many of these factors need to be considered at a route rather than network level it is important that we are able to predict the consequences of our plans on individual routes with the required degree of accuracy, and the impact on the train operators using these routes.

Our current planning processes do not provide us with this facility and we need to improve our ability to develop route plans, based upon the 26 Strategic Routes used by the SRA in the development of their Route Utilisation Strategies. We plan to discuss these issues with the SRA and passenger and freight customers in the late spring and early summer in order to develop a robust method for prioritising expenditure. Our aim is to establish a process that is fully transparent to our customers, and applied consistently across the network. We expect to publish the results of this work in an updated Network Stewardship Criteria later in the year.

Our expectation is that by the commencement of the 2005 business planning process we will have developed an initial prioritisation framework, underpinned by appropriately prioritised asset policies. This planning process will refine these strategies and policies, allowing us to gain an improved understanding of the impact on route and network outputs, and enhance our ability to develop an optimised plan. During this period, we will also seek to refine further our decision-making tools.

National expenditure summary

Figure 3.2 National OM&R expenditure projections

£m	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
2003/04 prices	(forecast)										
Operating expenditure											
Controllable	1,016	966	880	823	786	746	739	730	722	714	700
Non controllable	232	227	229	228	229	229	230	230	231	232	232
Total operating expenditure	1,248	1,193	1,110	1,052	1,015	975	969	960	953	946	932
Maintenance	1,316	1,251	1,151	1,059	974	896	877	855	834	811	795
Renewals (non-WCRM)											
Track	650	609	703	678	674	669	837	848	828	807	791
Structures	304	301	278	315	356	338	331	325	318	312	306
Signalling	212	301	376	421	500	524	540	629	740	777	761
Electrification	35	47	60	88	91	86	95	93	91	89	87
Plant & Machinery	165	178	77	59	55	50	50	45	40	40	39
Telecoms	231	224	189	265	258	58	120	122	109	78	59
Stations and Depots	120	176	165	174	193	195	197	173	177	152	151
IT (and other)	112	129	129	102	96	96	95	94	93	91	89
Total Renewals (non-WCRM)	1,829	1,965	1,977	2,104	2,223	2,016	2,265	2,329	2,396	2,348	2,283

£m 2003/04 prices	2003/04 (forecast)	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Renewals (WCRM)											
Track	577	361	251	64	17	14	-	-	-	-	-
Structures	79	81	72	20	8	2	-	-	-	-	-
Signalling	326	300	212	141	82	40	-	-	-	-	-
Electrification	203	212	192	72	1	1	-	-	-	-	-
Plant & Machinery	33	26	16	12	8	5	-	-	-	-	-
Telecoms	121	66	22	6	7	1	-	-	-	-	-
Stations and Depots	0	0	1	1	0	0	-	-	-	-	-
IT (and other)	2	0	0	0	0	0	-	-	-	-	-
Total renewals (WCRM)	1,341	1,048	767	316	121	62	-	-	-	-	-
Total renewals	3,170	3,013	2,744	2,420	2,344	2,078	2,265	2,329	2,396	2,348	2,283
Total operating expenditure, maintenance and renewal	5,734	5,457	5,005	4,531	4,333	3,949	4,111	4,144	4,183	4,105	4,010
Enhancements											
Funded by interim review											
Safety schemes	132	178	159	133	123	115	-	-	-	-	-
West Coast	242	252	181	116	51	8	-	-	-	-	-
Transition projects	204	636	88	20	-	-	-	-	-	-	-
SRA committed	21	88	20	0	-	-	-	-	-	-	-
SPV schemes	-	-	0	76	5	4	-	-	-	-	-
Non SRA funded	30	96	49	29	-	-	-	-	-	-	-
Network Rail (or joint venture funded)	131	59	53	54	52	62	-	-	-	-	-
Total enhancements	761	1,308	551	429	231	188	-	-	-	-	-

Expenditure breakdown by business unit

East Anglia

Figure 3.3 Forecast expenditure (East Anglia)			
£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	144	143	143
Renewals			
Track	79	86	77
Structures	28	26	25
Signalling	22	21	24
Electrification	6	7	8
Plant and machinery	1	1	4
Telecoms	3	3	6
Stations	9	9	8
Depots	3	2	3
Lineside	2	5	3
Total renewal	154	159	158
Planned and committed enhancements			
CTRL blockade works	6	1	-
Other	4	1	1
Total committed enhancements	10	1	1

Figure 3.4 Forecast activity volumes (East Anglia)			
	2004/05	2005/06	2006/07
Rail renewal (km per year)	104	127	105
Sleeper renewal (km per year)	77	106	94
Ballast renewal (km per year)	77	105	86
S&C renewal (units per year)	23	34	45

Great Western

Figure 3.5 Forecast expenditure (Great Western)

£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	189	187	187
Renewals			
Track	132	175	122
Structures	56	54	56
Signalling	31	59	66
Electrification	0	0	0
Plant and machinery	4	5	9
Telecoms	4	2	3
Stations	13	11	9
Depots	7	3	3
Lineside	3	3	4
Total renewal	250	312	272
Planned and committed enhancements			
Aberdare line platform extensions	2	-	-
Energlyn - new station	0	2	-
Old Oak Common - wheel lathe installation	4	0	-
Paddington long-term vehicular access	4	3	2
Paddington MacMillan House retail	2	-	-
Probus-Burngullow dualling	9	-	-
Region UPS phase 1 works	1	-	-
The Vale of Glamorgan railway line	16	1	-
Total committed enhancements	39	6	3

Figure 3.6 Forecast activity volumes (Great Western)

	2004/05	2005/06	2006/07
Rail renewal (km per year)	124	149	113
Sleeper renewal (km per year)	113	159	126
Ballast renewal (km per year)	122	173	143
S&C renewal (units per year)	73	81	78

London North Eastern

Figure 3.7 Forecast expenditure (London North Eastern)

£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	163	160	160
Renewals			
Track	85	101	92
Structures	50	46	44
Signalling	51	54	59
Electrification	7	6	7
Plant and machinery	5	4	5
Telecoms	6	5	9
Stations	16	11	9
Depots	6	3	3
Lineside	3	3	4
Total renewal	227	234	232
Planned and committed enhancements			
Allington chord	6	6	0
Doncaster interchange	1	1	0
ECML improvement schemes	9	-	-
ECML performance schemes	1	-	-
Jarrow branch doubling of Nexus Metro South Shields line	0	1	1
National Rail museum Shildon	2	-	-
Sheffield station masterplan project	5	3	-
Sunderland Tyne & Wear Metro extension	5	1	-
Other	7	4	1
Total committed enhancements	36	14	2

Figure 3.8 Forecast activity volumes (London North Eastern)

	2004/05	2005/06	2006/07
Rail renewal (km per year)	121	149	107
Sleeper renewal (km per year)	85	111	101
Ballast renewal (km per year)	80	112	97
S&C renewal (units per year)	39	47	39

Midlands

Figure 3.9 Forecast expenditure (Midlands)

£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	181	179	179
Renewals			
Track	106	116	135
Structures	28	26	38
Signalling	68	80	100
Electrification	9	9	14
Plant and machinery	4	4	2
Telecoms	5	1	4
Stations	25	12	10
Depots	2	3	3
Lineside	2	2	2
Total renewal	251	253	308
Planned and committed enhancements			
Bescot yard sidings	4	-	-
Chiltern - Evergreen 2	-	0	75
CTRL Blockade	102	9	-
Frankley extension to Cross City line	0	0	22
Southampton - West Coast/Cherwell Valley	7	-	-
Other	5	2	1
Total committed enhancements	118	12	97

Figure 3.10 Forecast activity volumes (Midlands)

	2004/05	2005/06	2006/07
Rail renewal (km per year)	159	150	152
Sleeper renewal (km per year)	104	116	132
Ballast renewal (km per year)	110	138	189
S&C renewal (units per year)	90	98	121

North West

Figure 3.11 Forecast expenditure (North West)

£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	156	155	155
Renewals			
Track	45	52	72
Structures	21	17	34
Signalling	25	26	40
Electrification	6	7	9
Plant and machinery	6	3	2
Telecoms	5	3	6
Stations	14	13	11
Depots	1	2	3
Lineside	2	2	3
Total renewal	124	126	179
Planned and committed enhancements			
All managed stations commercial investment	0	1	1
Bayley lane level crossing	1	-	-
Station refurbishments for MPTE	6	11	-
Bootle Oriel Road refurbishment	2	-	-
Liverpool Lime Street takeover	1	-	-
Liverpool South Parkway (Allerton interchange)	11	6	-
Liverpool Waterloo new lift installation	1	-	-
New Station - Chorley ROF (Buckshaw Holt)	0	2	1
Old Roan station subway	2	-	-
Southport station refurbishment	2	-	-
St Helens central revitalisation	4	-	-
Other	2	0	-
Total committed enhancements	31	20	1

Figure 3.12 Forecast activity volumes (North West)

	2004/05	2005/06	2006/07
Rail renewal (km per year)	52	74	88
Sleeper renewal (km per year)	50	54	76
Ballast renewal (km per year)	53	63	85
S&C renewal (units per year)	28	41	71

Scotland

Figure 3.13 Forecast expenditure (Scotland)

£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	109	108	108
Renewals			
Track	38	36	66
Structures	43	42	50
Signalling	18	29	40
Electrification	2	8	11
Plant and machinery	5	2	3
Telecoms	4	5	6
Stations	7	10	8
Depots	4	3	3
Lineside	2	1	1
Total renewal	124	136	188
Planned and committed enhancements			
Edinburgh tram enabling work	0	1	1
G&SW Mauchline / Auchinleck	-	1	-
Gartcosh new station	2	-	-
Inverness depot remodelling enhancement	1	0	-
Larkhall – Milngavie	18	12	-
Markinch station interchange	1	-	-
Stirling /Alloa - reopening to passenger and freight	1	-	-
Other	3	1	1
Total committed enhancements	25	14	1

Figure 3.14 Forecast activity volumes (Scotland)

	2004/05	2005/06	2006/07
Rail renewal (km per year)	42	49	93
Sleeper renewal (km per year)	29	33	65
Ballast renewal (km per year)	32	52	77
S&C renewal (units per year)	27	24	44

Southern

Figure 3.15 Forecast expenditure (Southern)

£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	231	229	229
Renewals			
Track	120	122	115
Structures	65	61	63
Signalling	72	90	84
Electrification	13	24	38
Plant and machinery	5	5	7
Telecoms	2	3	5
Stations	22	31	26
Depots	3	4	4
Lineside	2	4	5
Total renewal	304	344	346
Planned and committed enhancements			
All managed stations commercial investment	1	2	2
Carriage machine upgrade	1	-	-
Charing, Harriesham, Hollingbourne platform extensions	3	-	-
CSE buffer stop modifications	3	-	-
CSE depot security enhancements (excl Grove Park)	1	-	-
DLR extension to Woolwich Arsenal	0	1	0
Holborough cement works	0	3	3
Medway Valley AWS	10	0	-
Platform extension programme (Cat 1)	22	4	-
Slade Green depot	1	-	-
South Hampshire rapid transit	0	1	0
Southern Region power supply upgrade	460	74	20
Tonbridge and Victoria CET/CWM	4	-	-
Other	6	1	0
Total committed enhancements	513	85	27

Figure 3.16 Forecast activity volumes (Southern)

	2004/05	2005/06	2006/07
Rail renewal (km per year)	134	151	146
Sleeper renewal (km per year)	102	106	102
Ballast renewal (km per year)	101	105	102
S&C renewal (units per year)	69	100	108

Railway estates

Figure 3.17 Forecast expenditure (managed stations)			
£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	13	11	11
Renewals	36	22	55
Planned and committed enhancements			
Commercial investment	1	0	0
Total committed enhancements	1	0	0

Note: The above table excludes Railway estates expenditure identified at a regional level.

West Coast

Figure 3.18 Forecast expenditure (West Coast)

£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	6	12	12
Renewals			
Track	361	251	64
Structures	81	72	20
Signalling	300	212	141
Electrification	212	192	72
Plant and machinery	26	16	12
Telecoms	66	22	6
Stations	0	1	1
Depots	-	-	-
Lineside	-	-	-
Total renewal	1,048	767	316
Planned and committed enhancements			
WCRM enhancements	252	181	116
Total committed enhancements	252	181	116

Figure 3.19 Forecast activity volumes (Southern)

	2004/05	2005/06	2006/07
Rail renewal (km per year)	138	99	-
Sleeper renewal (km per year)	135	126	-
Ballast renewal (km per year)	115	97	-
S&C renewal (units per year)	198	215	-

Other nationally managed expenditure

Figure 3.20 Other nationally managed expenditure			
£ m (rounded) in 2003/04 prices	2004/05	2005/06	2006/07
Maintenance	60	(33)	(125)
Renewals			
Track	4	15	(1)
Structures	10	5	5
Signalling	13	16	10
Electrification	4	(1)	1
Plant and machinery	148	53	27
Telecoms	183	166	220
Stations	2	3	(2)
Depots	2	4	3
Lineside			
Other	5	2	2
IT	124	127	100
Total renewal	494	390	366
Planned and committed enhancements			
ATWS	10	16	11
Property enhancements	21	31	15
Contaminated land legal costs - provision	2	2	-
Contaminated land provision	10	6	5
ERTMS and train protection strategy	10	17	11
ERTMS first application for SRA	-	-	1
ERTMS system concept development	4	4	6
EWS fund	2	2	-
Expenditure for on-train GSM-R equipment	5	10	31
Felixstowe - Nuneaton gauge works	18	-	-
Fire safety - Safety & Environment funded	2	-	-
Incremental output statements - SRA funded	20	14	-
Incursions provision	4	5	4
Landfills	1	0	1
Level crossings	17	10	9
Minor signalling schemes	8	5	5
Modern facilities at stations - SRA Funded	14	-	-
Old Dalby test facility	8	9	5
Pollution	23	27	27
Railway crime engineering (incl Fencing)	9	9	5
Residual Safety & Environment plan	28	33	30
Regional ERTMS	9	11	9
Thameslink 2000	32	-	-
TPWS+ development & Implementation	12	0	0
Other	17	5	8
Total committed enhancement	284	217	180