

# Section 2

## Introduction

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# Purpose

Our objective is to deliver a safe, reliable and efficient rail infrastructure for the national network. As the provider of a key service in an industry upon which millions of people depend every day for work or pleasure it is appropriate that customers, funders and the travelling public understand how we intend to deliver this objective in an efficient and effective manner. The 2003 Technical Plan describes how we intend to achieve our vision of engineering excellence in the delivery of our network stewardship obligations at a national, network-wide level, and in particular:

- how we ensure the safe and efficient day-to-day operation of the rail network;
- how and when we carry out maintenance and renewal of the network;
- how we are seeking to balance the demand for access to the network to carry out this work with the needs of our customers to run train services; and
- how we integrate our work programme with enhancement initiatives designed to develop the network.

These plans are disaggregated to the 45 strategic routes in the Route Plan document. This Technical Plan forms part of a comprehensive suite of documents which contains details of our plans, policies and processes, as shown below. Together with the Business Plan Summary, Financial Plan and the Network Stewardship Criteria it fulfils the requirements of Network Licence Condition 7.

**Figure 2.1 Business Plan Suite of Documents**



# Introduction

Increased demand on the rail network since privatisation (with demand up by 30% since 1995/96) coupled with an ageing infrastructure has led to a position where the performance of the rail network is not acceptable. This situation is exacerbated by the complex system dynamics of railway operations and the sensitivity of train service reliability to changes in the usage/utilisation of the network.

With parts of the network operating close to full capacity, the railway is highly sensitive to relatively minor sources of disruption. The knock-on impact of an individual delay to a train (whether as a result of infrastructure or train failure) rapidly compounds, resulting in total delays many times greater than those caused by the immediate problem. Asset reliability reduces as the age of the infrastructure increases, a situation compounded in recent years by severe weather, in particular heavy rain causing widespread flooding and embankment slips.

The ability to recover the service following an incident is highly dependent on the degree of spare capacity available on the route. In addition to significant growth in recent years, there have been a number of other changes which have reduced the effective capacity of the network. These include an increase in the number of speed restrictions (as a result of asset condition), changes in train driving style (professional driving techniques), increases in station dwell times (growth in passenger numbers), more renewal and enhancement works requiring possessions, and safety-driven procedure changes. Each factor in isolation may appear minor, but the combined effect pushes the utilisation of the network further up the congestion curve, where it is increasingly vulnerable to substantial delay arising from even minor sources of disruption.

## Our Improvement Agenda

Prior to our acquisition of Railtrack, completed in October 2002, we developed a change programme that was designed to deal with the immediate challenges in improving the stewardship and reliability of the network and to provide a platform for an ongoing longer-term improvement programme. Since October this change programme has been refined, building on the many initiatives that were already underway within Railtrack, and implementation of the programme has commenced.

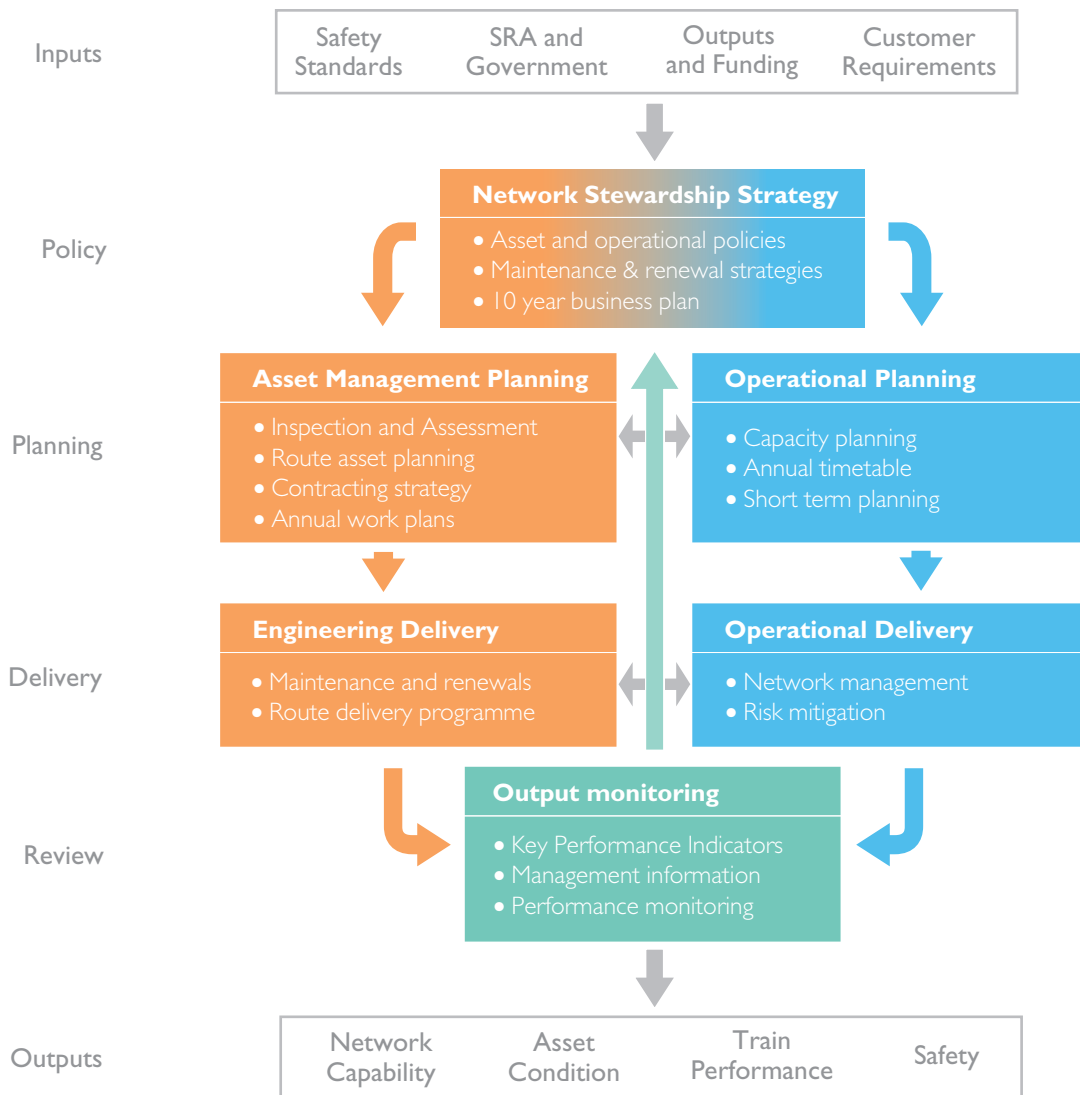
In developing our plans we have considered from first principles what we must deliver to our train operator customers through the operation of the network, and have based our improvement programme on what we have defined as our six core processes, see the figure below.

The plans identified are the primary driver for the achievement of four of our seven key business objectives, namely:

- improved safety;
- improved train performance;
- increased system capability; and
- improved asset stewardship.

They also contribute significantly to the achievement of the remaining business outputs: improved customer and stakeholder relations, improved financial control and improved business performance.

**Figure 2.2 Key Business Processes**



## Our Six Core Processes

### Network Stewardship Strategy

In simple terms this requires a comprehensive understanding of what our customers, funders and other key industry partners expect from the rail network (defined as our business inputs), determining what we must do to meet these expectations (our business outputs) and defining how we intend to ensure that we meet these expectations via a set of interrelated network operations and asset policies. The policies produced are supported by our maintenance and renewals strategy, and a business plan setting out what we intend to do over the next 10 years, what it will cost to carry out this work and what it will deliver in terms of asset condition, train service reliability etc.

There are four key inputs which our Technical Plan needs to address:

- Safety. We are regulated for safety purposes by the Health and Safety Executive, through Her Majesty's Railway Inspectorate (HMRI). We must ensure compliance with: HSE regulations and policies; our Railway Safety Case and the agreed recommendations arising following accident inquiries.
- Strategic Rail Authority. As our major funder the SRA provides strategic direction and leadership to the railway industry.
- Office of the Rail Regulator. As our economic regulator the ORR identifies criteria against which our network stewardship effectiveness is measured.
- Customers. Understanding our customers' requirements and aspirations is key to our success.

### Asset Management Planning

Having identified the asset policies that will deliver the required asset condition and reliability, it is necessary to develop robust plans to deliver these. Asset Management Planning is concerned with the identification of detailed work programmes (i.e. renewal workbanks – work details at an individual asset level; and maintenance activities) for the next three years. These programmes will also take account of any enhancement initiatives, including those agreed with the SRA. Underpinning the effective identification of these work programmes is good asset knowledge.

In developing these plans cognisance needs to be taken of any factors that may constrain our ability to deliver this work. As network access is a key constraint, this process has a strong link to the Operational Planning activity described below. Other potential constraints include in-house expertise, supplier resource and potential funding restrictions.

### Engineering Delivery

The delivery of the workbanks identified by Asset Management Planning is managed through the Engineering Delivery process. Good planning is essential to the effective and efficient delivery of this work. Optimum use of network access and supplier resources requires the development of route plans which integrate maintenance, renewal and (where appropriate) enhancement activities across all assets. Robust supervision will ensure that the required work is delivered safely and economically within the time allocated.

## Operational Planning

A reliable infrastructure is only part of the solution to a dependable train service. What is also required is a robust timetable and the means of delivering this timetable, particularly following service disruption. As a consequence operational planning has three primary functions:

- capacity planning over a 10 year horizon to ensure the synchronisation of plans for the provision of network capacity, and plans for train services which will consume that capacity;
- annual access planning which produces the “permanent” timetable which is published as the National Rail Timetable (NRT); and
- daily access planning which incorporates temporary changes into the timetable to meet short-term traffic demands and to accommodate engineering works on the network.

## Operational Delivery

Operational delivery includes those actions necessary to ensure the safe and reliable delivery of the timetable. Two key tasks are involved:

- network management: the real-time process by which we monitor and control the movement of trains on our infrastructure, with the primary objective of maximising the delivery of services in accordance with the timetable; and
- risk mitigation: identifying the key causes of delay and disruption and taking action to manage and mitigate these risks.

## Output Monitoring

Having identified the key network outputs, in terms of asset condition, network performance etc, it is important that there exists a clear and concise methodology to ensure that what is actually delivered is measured against what was expected to be delivered. Central to this are clearly defined performance targets and key performance indicators (KPIs). The ability to monitor progress against these KPIs enables feedback throughout the organisation to ensure that appropriate and timely corrective action is taken, either at a strategic or tactical level.

This includes the use of forecasting and statistical tools to improve our understanding of the complex interrelation of factors that cause train delay, and assist us in the development of robust and achievable timetables.

## Improving Train Performance

One of our key objectives is improving train service reliability (otherwise known as train performance). The complexity of the rail network, the differing needs of industry partners and inter-relationship between the number of train paths operated and train performance creates a very significant challenge for the industry. Our approach to performance improvement recognises the factors that contribute to poor train performance and seeks to 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 (i.e. the delivery of the timetable, including recovery following service disruption).

Achieving improvements in train performance requires clearly focused actions to ensure that these factors are addressed cost effectively and in a manner that reflects their relative contribution to the problem. Improved asset reliability provides a major lever to 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 critical to the performance of the network - and require access to the network for the work to be carried out. Unfortunately it is the assets that are most important to train reliability that are located on the busiest parts of the network. The safe and economic access for renewal and maintenance of these assets can therefore often only be achieved by closing the route to traffic. This can be unpopular with our customers but vital to sustainable train performance.

Addressing infrastructure reliability is only one part of the equation. Equally important is the robustness of the train timetable itself 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. An over-stretched network cannot recover rapidly from such an incident.

We recognise that the overall amount of track access is limited by the capability and availability of the infrastructure, by current operational rules and procedures, and by historical access allocations. Equally, we know that the demand for train paths may continue to grow, and that there is an increasing volume of infrastructure work that will require greater restrictions of use (including possessions and temporary speed restrictions).

To address this we are seeking to modify our processes, so that we can capture and reconcile these competing demands in a fair and open manner, consistent with contractual and regulatory obligations. We are attempting to do this to timescales that maximise the benefits of timely planning, but also provide sufficient forward certainty to enable customers and suppliers to make their own, dependent, plans with confidence and in a timely manner.

Asset and network policies identified later in this plan have been developed to meet these challenges. The complexity of the performance equation and our emerging, but still not complete, understanding of the relationship between activities and outputs means that we are not yet in a position to target effectively the contribution to performance improvements from individual initiatives, nor to ensure that we have the optimum balance between the relative contributions of improved asset reliability and improved network operations. However, addressing some of the key issues provides us with an early opportunity to make significant progress whilst we develop the tools that enable optimised plans to be produced. We describe some of our short-term initiatives to improve asset reliability in Section 5.

## Scale of the Challenge

This improvement agenda needs to be considered in the context of our current position, at a relatively early stage in the transition from Railtrack to Network Rail. The initial Technical Plan, shared with funders in November 2002, has formed the basis of this document. Work to further refine the plan will continue. A key task is the continued development of a high level business process model to cover all key activities. This will provide a more robust framework to develop our vision for business improvement, and improve the alignment of individual change initiatives. As such this plan should itself be considered as transitional, reflecting the early stages of our strategy to deliver a measurable step change in asset reliability and train service performance.

## Document Structure

We have structured this Technical Plan around our six core processes and devoted a section to each – **Sections 3 to 8**. In each of these sections we explain the primary purpose of the process, the basis upon which it has contributed to our March 2003 Business Plan and, where sufficiently developed, details of our plans to improve the process and its application.

For clarity the specific plans for each of the asset disciplines are contained within a separate section, **Section 9**. For each asset type we set out how we have developed our asset policies to meet the business drivers; how these policies are converted to workbanks; and how we plan to deliver this work as efficiently as possible.

We have developed a comprehensive series of action plans to address the current unacceptable level of train performance. We have prepared a commentary on this recovery plan, bringing together the various initiatives and actions plans in **Section 10**.

**Section 11** provides maps of the network identifying its capability in terms of line speed, loading gauge, axle load, electrification and capacity utilisation (i.e. its capability to carry additional traffic).

## Health, Safety, Quality and Environment

The Health, Safety, Quality and Environment Plan is compiled annually and comprises the health, safety, quality and environment policies and strategies common to the company. It further details the arrangements for delivering these policies. This plan provides the guidance and direction for the development of the appropriate elements of the asset policies within this Technical Plan.

The HSQE Plan is underpinned by the Safety and Environment Plan (S&E Plan) which contains the detailed subset of actions that we will undertake to improve our organisation and enhance our infrastructure in support of the policies outlined in the HSQE Plan. These actions specifically target compliance to legislation, control of safety risk, managing environmental impact and delivering quality improvements.

The Safety & Environment Plan will no longer be an annual plan, as published by Railtrack in previous years. Whilst still published annually, it is a three year rolling plan that will be subject to on-going monitoring and management review. It focuses on the development and implementation of longer-term HSQE improvement strategies. The S&E Plan contains both the safety-focussed initiatives presently being implemented by specific plans such as track quality, and future projects that are driven by legislation, enquiry recommendation, and changes in standards. Where initiatives fall into the former category, they are contained within the appropriate asset group.