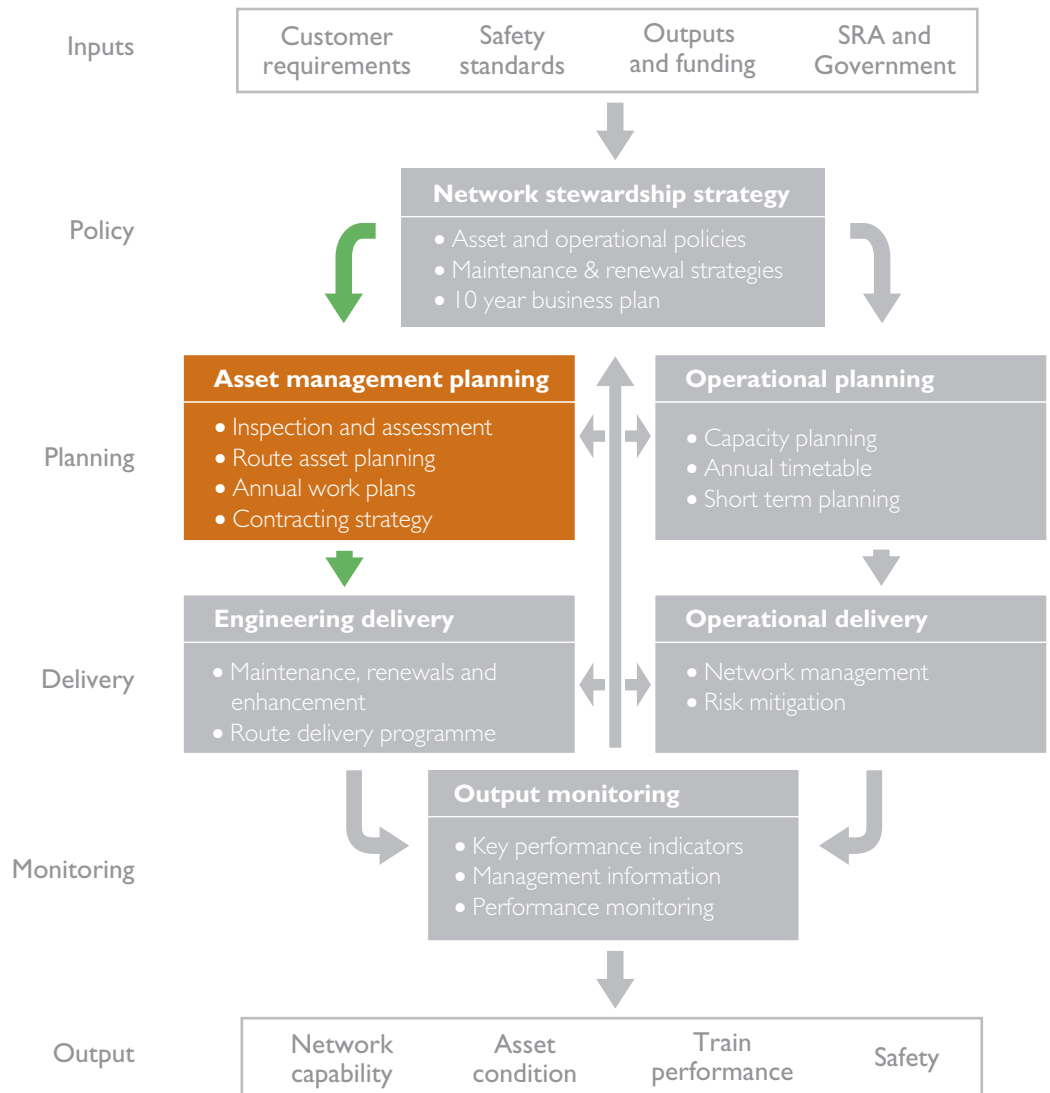


Section 4

Asset management planning



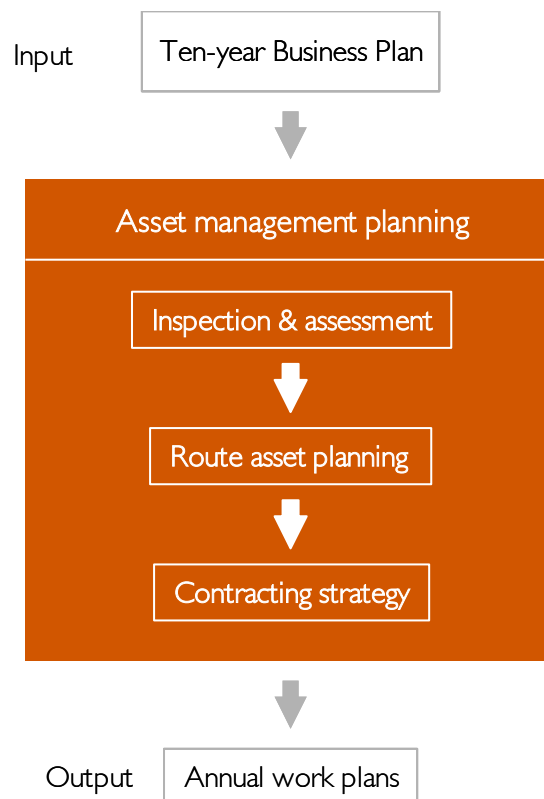
Objective

Asset management planning is the process used to develop detailed plans for maintenance and renewal activities that put into effect the policies identified by our Network Stewardship Strategy and deliver the related goals. Work identified is then prioritised to generate annual work plans for the next three years

Approach

The ten-year business plan identifies the asset policies that must be implemented to deliver the required infrastructure condition and capability. For each asset discipline, maintenance strategies have been defined, the optimum maintenance/renewal interface determined and replacement asset types identified. Detailed plans are then identified to deliver agreed asset policies and objectives within the constraints framework of funding, resources and network access. This framework is illustrated below.

Figure 4.1 Asset management planning



In this section we identify our long-term objectives for the asset management planning process and set out our priorities and plans for delivering significant change over the next two years.

The four key activities required to produce robust annual work plans are:

- **inspection and assessment** – we must identify the gap between the desired asset condition (as identified within the asset policies) and the actual condition (from the measurement and assessment of individual assets) in order to determine the actions required to bring the asset to the desired state. This should be achieved using information processes and decision support tools which are consistent, efficient and effective;
- **route asset strategy** – in order to prioritise the delivery of this work it is necessary to understand the criticality and outputs required of the route (both to our customers/funders and ourselves), proposed enhancements and availability of network access. Prioritisation will be through a consistent, risk-based assessment process;
- **annual work plans** – the output of this series of activities is optimised and deliverable workbanks (for renewals and enhancement activities) and maintenance volumes for the next three years. Also identified are costs, network access and other resources required to deliver this work effectively and efficiently. Where resource or access constraints preclude the proposed works from being carried out at the optimum time, appropriate mitigation proposals are identified. The work plans are used by business units to develop and update their business plans and form the basis of a route delivery programme to be implemented as described in the section on engineering delivery; and
- **contracting strategy and supply chain management** – robust strategies must be in place to ensure that we retain ownership of critical core activities, and that the necessary goods and services can be procured cost-effectively. This is a particularly critical activity where supply-side resource constraints exist that could potentially impede the implementation of our plans.

Significant progress has already been made in addressing the shortcomings in our existing processes. Continuing actions over the next two years that will enable the delivery of our long-term goals are:

- targeted improvements in the quality and availability of asset data and developing a prioritised action plan to improve related information systems;
- the continuing introduction of new inspection technology;
- extending the asset planning horizon to provide initial renewals work lists and maintenance volumes three years before delivery;
- development and implementation of a standard prioritisation and risk management methodology;
- adoption of a route-based approach to asset planning and prioritisation; and
- the move to in-house maintenance, which will redefine the processes, organisation and contracts for infrastructure maintenance.

Inspection and assessment

The key to effective planning is a comprehensive understanding of our infrastructure, its current condition, and an awareness of its likely future condition based upon current maintenance regimes and traffic forecasts. The suite of decision support tools (DSTs) we are developing will assist us in identifying when an asset should be inspected. This decision will be validated from other sources such as local recommendations. The information is used to plan a programme of site inspections, and for the collation of supporting information. The site inspections are undertaken using appropriate technology by our own engineers supported, where required, by engineers from the maintenance contractor where the asset in question is not maintained by our in-house teams. These inspections generate a work recommendation and a priority that is recorded in the workbank database.

Asset information and collection

Our Asset Information Strategy (published biannually) provides details of the programmes of work underway to improve our knowledge of the configuration, condition and capability of our assets, and how these relate to network capacity. Our strategy is designed to provide a set of systems and processes capable of supporting our own and our partners' asset information requirements. Essential to our plans is the migration from the current localised information systems to one where a single and robust version of all data is available throughout the organisation. There are four principles that underpin this strategy: ownership, availability, integration and consistency.

The challenge facing us is to improve control of our data and ensure it is suitable for its purpose. Substantial investment and significant progress have been made in developing enablers, infrastructure and data management processes. Examples include:

- an asset data dictionary that holds data definitions and data collection rules for key asset systems (e.g. RAR, GEOGIS, MIMS, NETRAFF, RAILDATA);
- an asset data viewer that utilises the data dictionary to pull selected data from asset systems, this is a forerunner for the capability that will be provided by data warehouse technology;
- a comprehensive set of asset data maintenance procedures have been developed and implemented, vital in ensuring that the quality of our data does not degrade over time; and
- an over-arching data quality framework is currently being developed. This will address data policy, quality standards, and provide a framework for data cleansing to an appropriate standard.

Collectively, these initiatives will enable us to:

- know what data is needed and to what quality;
- know what data we have and where it resides;
- have a tool to support data migration to a modern data repository;
- understand the data cleansing priorities;
- be able to sustain the quality of data once cleansed;
- have tools to facilitate visibility, access and integration of data; and
- have an accurate representation of the network.

Inspection

The work to take increasingly direct control of the inspection and examination of the network, referred to in the 2003 Technical Plan, continues. This is providing better quality information and an improved assessment of the current condition of the network. It will be aided by the taking in-house of maintenance activities, effectively clarifying and simplifying the lines of communication and accountability. The approach is centred on two principles: intelligent, targeted examination for decision support, rather than simply as an audit; and increased automation. Successful implementation of this approach will facilitate a move from reactive to largely proactive maintenance.

Increased automation introduces considerable benefits. The reduced need for personnel on the track has direct safety benefits, and data accuracy and consistency is increased. Network disruption is reduced by the use of high-speed train-borne inspection equipment. Improvements in data handling are enabling us to interpret the large volumes of data produced by automated inspection more effectively.

There are many specific asset discipline initiatives that form part of this coordinated strategy for inspection and examination. Current initiatives include:

- the New Measurement Train which incorporates multiple inspection and examination systems and a 125mph maximum speed, which enables easier operation within the timetable;
- unattended track geometry measurement systems are being fitted to in-service trains to allow frequent inspection of critical routes. The first two systems are being trialled on the Chiltern Route and further fitments are planned; and
- the Southern measurement train system, which provides a mechanism for the unattended collection of video and other information. Information collected includes rail surface, track geometry, signal visibility and vegetation clearance data.

Nearly 90% of the network has now been recorded using three-dimensional video survey techniques. This has assisted asset data collection work for many asset groups, giving cost savings and safety benefits through reduced exposure of personnel to the trackside. It also has a number of other uses, such as driver route familiarisation and access planning for work in possessions. The video recordings are being used to assist decision-making and planning but are not currently suitable to replace completely on-site visual inspection. Video server trials have been completed and desk-top access to the video survey information continues to be rolled out across the company this year. Currently there are over 750 users trained. Further development will incorporate digital pattern recognition systems and be fitted to the new infrastructure inspection trains. This could enable the selected replacement of some on-site track inspections. We will continue the surveys to further improve network coverage and record recent changes in assets and condition.

Route asset planning

In order to reconcile successfully the objectives, activities and funding specified in the ten-year plan with the output of the inspection and assessment process, it is necessary to:

- understand the outputs required at route level in order to deliver our customers' reasonable requirements;
- understand the constraints on delivery;
- understand the relationship between renewals and the SRA's priorities for enhancements; and
- prioritise work activity to meet the objectives cost-effectively.

Our goal is to have route-based plans as the basis for this process. Each route asset plan will ultimately set out both the customer requirements detailed in the Local Output Commitments and how these requirements will be delivered within the constraints identified by the ten-year business plan. Current details for each of our routes can be found in the Route Plans document.

Identification of necessary work

Understanding the desired condition of the asset, its actual condition, and the most cost effective and appropriate means of achieving the desired condition facilitates the identification of the work that will be necessary to maintain the asset in a fully functional condition. The work recommended could range from continuing maintenance to complete renewal.

Where a renewal is identified an assessment of expected remaining life is made, and although subjective, this provides a simple check within the prioritisation system, and is used to trigger re-inspection and mitigation work. Any mitigation work must be identified in case it proves impossible to undertake the work within the estimated remaining life. Possible mitigations include enhanced maintenance, partial renewal, temporary speed restrictions or, in extreme cases, taking the asset out of use. Mitigations may also be necessary where the asset is found to require work more urgently than allowed for by the lead time for planning and implementing a renewal, or where there is a rapid and unexpected deterioration in asset condition. Alternatively where the asset is found to be non-compliant it may be appropriate to create a temporary non-compliance (TNC), and these will also require mitigating actions pending renewal. The TNCs are controlled as part of the derogation management process.

Prioritisation

Prioritisation of each of the necessary activities is required to be able to rank them in order of relative importance within the overall workbank. Recommendations put forward are assessed according to four primary factors, as set out below:

- the extent to which an effective alternative activity is available to mitigate any risks to the ongoing operation of the asset;
- the extent to which the work will lead to a reduction in safety risk;
- the extent to which the work will contribute towards meeting the company's regulatory targets; and
- the extent of the risk to train performance if the work was not done, measured in terms of compensation payments under Schedule 8 of the relevant track access agreements.

In addition, account is also taken of a series of secondary factors such as the relative difficulty of securing access and resources for the work, any logistical difficulties in relation to the worksite itself, and any other key risks to the company if the work were delayed. This allows an assessment of the relative risks, costs and benefits for the company.

As part of our new prioritisation framework these asset policies will be developed to provide a much clearer process to identify appropriate workbanks than exists at present. As the workbanks will be based upon the implementation of the individual policies this will minimise the degree of subjectivity that currently exists when route plans are developed at present. However, there will remain a need to prioritise activities along lines of route, possibly because of supplier or network access constraints, or localised asset deterioration. Our revised prioritisation method will use the outputs from the operational risk process, ensuring that this prioritisation is carried out in an integrated and consistent manner. This will include prioritising actions for the removal of unplanned TSRs.

Workbank reviews are carried out to ensure that the right work is being carried out at the right time. There are currently two levels of review carried out:

- engineering heads hold peer review meetings with regional engineering teams to assess the content of the workbanks and to ensure that a consistent approach to prioritisation is being taken across the network; and
- as part of the business planning process, Board directors review regions' work plans on a regular basis. Whilst the review of proposals for individual asset renewals is generally limited to major structures and signalling schemes, key issues associated with the production of the workbanks are discussed for all asset disciplines.

The absence of a standard approach to risk management across the company in the past has resulted in variations in the approach adopted by each engineering discipline. The peer review process has also suffered from inconsistent individual responsibilities and team structures between regions. The adoption of a standard methodology and the new functional structure will improve this process significantly.

Project lifecycles

A substantial risk encountered in the past related to the lack of a standardised process for the development of projects, particularly renewal projects. This made the prioritisation and management of projects cumbersome and inefficient. A major development during 2003/04 has been the implementation of a new set of control processes for our project and renewals activity, known as the Guide to Railway Investment Projects (GRIP).

GRIP provides consistency across the company and for our customers and suppliers, through the use of templated products and procedures that are uniformly structured. It redefines the project life cycle into eight clearly defined stages, with greater clarity of the accountabilities and responsibilities of both the sponsor and project delivery team. It mandates stage gate reviews to assess the fitness of the project, measured against predetermined deliverables, before proceeding to the next stage or seeking funding.

In February 2003 we released the first electronic version of GRIP. It was initially mandated for all enhancement projects and complex renewals. In September 2003 there was a second release of GRIP. This included procedures relating to operation of the EFA, which was a joint development with the SRA. The investment manual was enhanced with the inclusion of a second volume providing a financial model to support preparation of more robust business cases. The impact of this second release will be a more unified and consistent method of delivering projects across the whole company portfolio. It has given greater rigour to managing workbanks and planning delivery, which will support the drive for efficiencies.

A further release of GRIP is planned in 2004 to support the forthcoming organisational changes and to address safety and asset protection for projects being implemented by external parties on Network Rail infrastructure.

GRIP stages 1- 4

The investment project lifecycle is broken down into eight stages, reflecting the technical evolution of investment projects. The overall approach is product-driven rather than process-driven, with each stage required to deliver an agreed set of products to defined quality criteria. This lifecycle has been aligned with the SRA to ensure consistency with their processes.

The investment stages within the lifecycle reflect the significant business and technical milestones in the project's development and delivery. Within each stage, outputs are known as products. The initial four stages, shown below, cover the scoping, planning and optioneering of projects.

Figure 4.2 GRIP stages 1 - 4

1	Output definition	Establishes the scope of the investment in terms of the incremental network capability required by the investment's "client". This is described in terms such as journey time, capacity, loading gauge etc. It may also require the scoping of asset renewal.
2	Pre-feasibility	Ensures that asset condition, safety or standards requirements are identified and included in the scope of the investment. Ensures that investment is aligned with organisational strategy and contributes to targets. Identifies the constraints on the network that prevent the delivery of the client's outputs and defines the incremental capability that must be delivered by the investment. Provides confirmation that the outputs can be economically delivered by addressing the identified constraints.
3	Option selection	Develops options for addressing the identified constraints and delivering the required incremental network capability. Assesses the options and selects the most appropriate one, together with confirmation that the outputs can be economically delivered.
4	Single option development	Develops the selected single option to the point of engineering scope freeze and in sufficient detail to allow finalisation of the business case and scheduling of implementation resources.

Each completed stage is subject to a stage gate review. The purpose of this is to confirm that:

- the stage is complete;
- products are signed-off as meeting the quality criteria and are supported by proof of process and consultation;
- any variance from the products stated in the management plan for the stage is understood;
- external funding is in place for the following stage;
- commercial and project risks are identified and considered acceptable by the sponsor;
- risks associated with any proposed stage derogation are identified and assessed;
- plans and resources are available for the next stage;
- stakeholders have signed up to the proposals;
- the project is in the business plan; and
- costs to date and anticipated final costs are in line with previous funding authority and the business case remains valid.

Network access and delivery planning units

In 2003 the national and regional delivery planning units (RDPU) were introduced to provide the annual integrated work plan and associated access requirements. The network access unit (NAU) was also established to work with the RDPU and the train operators to agree the Rules of the Route. Building on this, we have introduced a structured work and access planning process, commencing three years in advance of any potential delivery date. This specifically identifies workbanks, work package optimisation, delivery method and provides constant feedback for continuous improvement.

Attention is also being focused on standardising track access arrangements so that possessions are routinely taken from a limited number of fixed locations that can then benefit from investment in automation and improvement in site access points. These standard possession-blocking points will be identified across the network throughout the coming year.

Progress is being made in optimising the delivery of engineering work through changing physical work practices. The potential for an automated link between the work and possession planning system is to be assessed with the aim of reducing the manual effort used in transferring and maintaining duplicate data in the systems. Working practice and information management system changes will be implemented where a business case exists.

Contracting strategy

Maintenance

In last year's Technical Plan we explained our New Maintenance Programme (NMP), and the initiative in the Reading contract area to take maintenance in-house in order to better understand the costs involved and derive other benefits. At the same time we also announced our intention to extend the initiative by taking Wessex and East Midlands contract areas in-house. Subsequent events and analysis of our experience in implementing both schemes led us to reassess our maintenance strategy. In October 2003 we announced our intention to take all core maintenance activities in-house.

Bringing maintenance in-house presents us with an opportunity to create an environment whereby the specification, delivery, and inspection of maintenance all sit within the organisation that holds the responsibility for asset stewardship. This will result in consistent application of high standards of rail maintenance across the rail network, the delivery of significant efficiency savings, and continued improvements in track-side safety standards. In re-designing the organisation a number of options were considered. However, the most effective was deemed to be the transfer of all IMC responsibilities into the current area based structure.

Renewals

Supplier strategies and management

Following the completion of the transfer to in-house maintenance, about 80% of the total external expenditure will be with about 200 key suppliers in the main functional activities, track maintenance, track renewals, signalling, utilities, track materials and logistics. The structure of our procurement organisation is being changed to align with the new functional organisation. The development of a competent and capable supplier base will further improve the industry supplier accreditation process, with Network Rail continuing to take the lead role working with the Health and Safety Executive, the Railway Safety and Standards Board and the other principal players in the industry. Improved supply chain processes and e-business solutions are also supporting the efficiency challenge and reverse auctions have been introduced for a number of low value commodities with significant savings.

General efficiency initiatives

Standards changes have been identified as adding significant cost to the business. A major change to the approach in justifying the business case for change and planning the implementation of changes to company standards has been implemented over the past year, which will reduce the number and impact of these changes. In addition a decision has been taken to freeze the impact of changed standards upon projects once they pass into detailed design, except in cases where there is a safety critical need to impose such change.

The general management challenge to reduce the need for consultancy support and longer-term agency personnel in favour of in-house resources is helping to reduce overheads. There are, however, a number of skills gaps particularly in specialist project management, planning and commercial disciplines. A targeted recruitment campaign together with a comprehensive training and development programme is planned to ensure the business has the professional skills required to manage following the completion of the restructuring.

Signalling efficiency initiatives

The signalling new works programme team has been established to undertake development and technical acceptance of signalling projects. This will expedite the development phase, allow process standardisation and improved scope control, thereby ensuring that costs in the development and design phases are minimised. This unit is now developing its first major schemes, and will take over all major signalling works as the business is restructured during 2004.

Our key suppliers are working with us to better understand, and remove, the constraints that impact on costs. Our general approach to major schemes will involve contracting directly with a number of trade suppliers and directly managing the integration risk, which will help to reduce overheads and improve delivery timescales.

Track efficiency initiatives

The drive for improved efficiency in track renewals has been spearheaded by a major restructuring of our supply arrangements, with new five-year term contracts being tendered for all plain line and S&C renewals over the past year and due to commence throughout 2004. These will generate economies of scale and incorporate a more transparent cost structure to facilitate planning and to improve resource utilisation. Each contract will be managed through an integrated Network Rail and supplier management team to ensure effective decision-making.

Optimising the benefits available from these contracts depends upon the workbanks being specified; whilst this has been anticipated to some degree, the re-planning necessitated by the interim review has disrupted this, and full benefits will not accrue until 2005/06. Delivery planning and packaging of works into longer possessions will also improve the productivity of track renewals progressively from 2004/05 onwards. The reduction of S&C unit costs is being led by reviewing opportunities to rationalise layouts and challenging specifications and designs for optimum value. However, the benefits from this are somewhat offset by a significant increase in the proportion of more expensive remodelling of layouts, which have tended to be deferred in recent years due to complexity, rather than simple renewals. The new supply strategy also involves us establishing direct design contracts from 2004/5.

New high output rebalancing and relaying plant will come on line progressively during the next two years, ultimately undertaking around a third of renewals volumes. This will help to drive down unit costs significantly, subject to securing flexible midweek access and continuous worksites. New wagon capacity, rail cranes and installation gantries are also due to come on-stream helping to improve reliability and productivity within possessions. We are also constructing a concrete sleeper manufacturing plant which will lead to reduced manufacturing and distribution costs and remove a major threat to continuity of supply, and rationalising rail welding plants to reduce distribution costs and improve service quality.

Structures efficiency initiatives

Changes to the supply arrangements for structures workload are less radical, but close working relationships with a small number of key suppliers are helping to steadily reduce unit costs. Examples of the joint actions generated include: the earlier involvement of contractors in design value management, direct NR procurement of high volume materials and improved forward visibility of workbanks to suppliers allowing optimum scheduling of works to suit resources. Competitive tendering of major works is being used selectively to complement and benchmark the framework and alliance arrangements already in place. New longer-term framework contracts will be put in place during the coming year to incentivise contractor investment in specialist installation and access plant.

Annual work plans

The annual work plans must be achievable, deliverable, and balance the needs of the customer with the engineering demands of the asset in developing a prioritised and detailed programme. Our planning horizon is still too short to maximise efficiency. However, the improving planning processes currently being developed will help to address this deficiency and allow an increasingly robust prioritisation of work.

The annual work plans generally contain four programmes in various stages of implementation (Y, which is the current year – i.e. 2003/04) and development (Y+1 to Y+3). The overall planning process is, however, continuous and not treated as discrete programmes. Therefore 2005/06 is the first programme year to which the new processes will have been fully applied. The emerging programmes for maintenance, inspection, and renewal will be combined with the enhancement programme. The resulting indicative access requests will form the starting point for a route delivery programme to be implemented, as described in Section 5.

To arrive at a deliverable work programme it is necessary to identify, quantify and assess the factors that may constrain our ability to deliver the required activities. These include:

- **funding** – the level available funding and its associated financial risk analysis;
- **engineering resources** – the availability of specialist and technical labour, plant, materials and services; and
- **access** – appropriate access to achieve an acceptable balance of cost and disruption.

The principal outputs of the annual work plan process are the committed work lists for maintenance, based on an annual volume assessment, the renewals workbank, a list of any enhancements and the indicative requirements for access. A key objective is to fix the non-maintenance elements of the route delivery programme two years prior to the point of delivery. The presumption then is that whilst refinement will be required, changes in renewal work scope and programme should be the exception. By minimising change, the ability to deliver the programme to cost will be significantly enhanced.

Planned maintenance volumes continue to be generated from an analysis of current activity volumes and costs, decision support tools, and local asset knowledge. The early estimation of this workload serves a number of purposes:

- to plan and progressively commit resources;
- to develop the route delivery programme;
- to optimise outputs against resources;
- to demonstrate an appropriate level of activity consistent with good asset stewardship; and
- to provide visibility of the volumes of work.

The estimated maintenance volumes cover the full range of activities including heavy maintenance, mechanised maintenance, scheduled maintenance, inspection and rapid response. This does not imply fixing the entire programme two years ahead, which would be impractical and unrealistic. It is more the forecasting of volumes as a starting point for resource planning. This forecast will be more reliable for the predictable elements such as scheduled maintenance and less so for the remainder.

Planned renewals volumes are expressed as a committed workbank and our goal is to issue it to the appointed contractors two years in advance to allow detailed programming. The contractor will develop the possession programme to deliver the works in the most efficient means possible as part of the route delivery programme process.

On completion of the processes described above, there will inevitably be items of proposed renewal work that cannot be accommodated in the programme due to one or more constraints. An appropriate mitigating action is included in the committed workbank based upon the recommendations from the site inspection. Any deferred renewals are retained in the planning database for reconsideration for a later programme year. Mitigations will usually be delivered through the maintenance programme. There is, however, the possibility that the most practical mitigation is a partial renewal in which case it will be delivered through the renewal programme. In either case there will be a cost implication to be managed.

The indicative access programme mainly takes the form of possessions required, and all forms of restriction of use. These include diversions and temporary speed restrictions. The development of this programme is the responsibility of the integrated planning units working with our programme management office. Where such restrictions are identified at the annual planning stage they will become part of the indicative route delivery programme and, together with the requests for infrastructure train resources, will be fed into the operational planning process. Within the present operational planning timetable, settling the annual business plan by T-67 will be vital to minimising change and abortive cost (where T indicates the issue date for the timetable and the number refers to the number of weeks prior to it).