

THE EFFECT OF COMPETITIVE CAPACITY ALLOCATION ON UK RAILWAY TIMETABLING

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1. ABSTRACT

Railways throughout Europe suffer from the fact that there is more demand for train paths on their networks than they are able to provide, requiring decisions to be made over how and whether to accommodate this demand. Investment in enhancing capacity may be an option, but it is more cost effective to ensure that the timetables adopted are structured to meet demand as well as possible.

The paper uses the authors' recent research in this area to discuss the method of capacity allocation and timetabling used on the UK national network (excluding Northern Ireland, whose state owned railway is independent of those on the mainland) and sets out a business process model, including the relationships between the various organisations involved. The paper reports on the findings from a series of interviews with stakeholders in the timetabling process, revealing key contentions and problems with the current system, how they are overcome, and the practical differences between the theory and practice of the timetabling process. The picture is brought up to date through a discussion of how the UK is implementing 2001/14 and recent changes in responsibilities, with the Strategic Rail Authority taking a bigger role in setting priorities. Finally the paper will examine current and possible future changes to timetabling processes that might resolve some of the problems uncovered and enable timetables to be developed that make better use of the available capacity.

2. THE UK RAIL INDUSTRY

2.1 Industry Structure

The UK railway industry comprises around 40 train operators (of which 25 franchised passenger operators operate the majority of the National Rail network). Infrastructure is primarily in the hands of a national Infrastructure Manager - this was Railtrack until 2002 when it was replaced by Network Rail (for the purposes of this paper, and because the research was undertaken prior to the change, we refer to Railtrack throughout). In addition, a number of other companies provide support services ranging from cleaning and catering to maintenance and engineering services. This paper does not address Northern Ireland's railway, which is still vertically integrated and state owned as part of an integrated transport undertaking, neither does it cover London Underground or other UK Metro operators, as these are not subject to the same legislation or competitive pressures.

A complex web of interactions connects these organisations. The Strategic planning of the railway is overarched by the the railway's legislative framework, as defined by the Railways Act 1993 and Transport Act 2000, together with a series of supporting EU Directives. This is then carried out through the government Department for Transport and its Strategic Rail Authority (SRA). The SRA lets the passenger rail franchises to Train Operating Companies (TOCs - the term is used in this paper to mean the franchised operators) which cover virtually all of the National Rail network. The franchise specification contains an obligation to run services over certain routes, by and large derivative of those operated by British Rail before privatisation, and minimum service requirements in the form of a Passenger Service Requirement (PSR). Regulation of the infrastructure is handled by the Office of the Rail Regulator (ORR), which is independent of government, primarily through capping the Infrastructure Manager's overall revenue and through approval of access agreements. In the seven largest UK cities outside London, covering about a quarter of the UK population, Passenger Transport Executives (PTEs) coordinate public transport, and fund, specify and market local rail services in their areas. Figure 1 shows a simplified version of the UK's rail industry structure (derived from Boodoo, 2002).

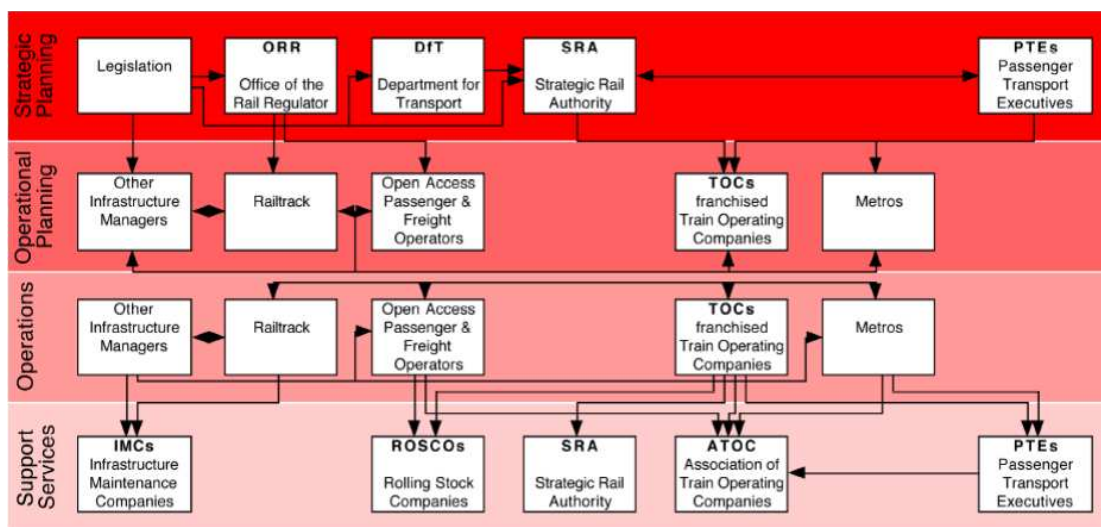


Figure 1. Structure and dependencies of the UK rail industry

Operational Planning is the process of producing plans for operating the railway. The main Operational Plan is the timetable, produced twice a year, although a number of other plans and documents are involved (see figure 2, below). Operational Planning is carried out between the Infrastructure Managers (Railtrack and others), and the operators. Three different classes of operator have different sets of rights: Franchised TOCs, which have legal obligations to access to the network, Open Access Operators, including freight and a small number of passenger operators such as Hull Trains running between Hull and London Kings Cross, and Metro operators London Underground and Tyne & Wear Metro, who operate partly over Railtrack routes. The process of Operational Planning in the UK is described in section 3.

Operations are carried out by the three groups of operators, together with operation of the signalling by Railtrack or the relevant Infrastructure Manager. Train control and station operations are managed by the operators (with each station assigned to an operator, aside from 17 major passenger stations looked after directly by Railtrack).

A number of support services exist to maintain and renew the rail infrastructure (primarily through Infrastructure Maintenance Companies (IMCs), to lease and overhaul rolling stock, the Rolling Stock Companies or ROSCOs for short, and to distribute revenue for passenger rail services where the passenger may have used two or more operators' trains to complete a journey. This is done through ATOC, the Association of Train Operating Companies, using a system known as ORCATS. In addition the SRA provides financial support, and PTEs provide multimodal tickets which can be used on any operator and on buses and trams.

A number of changes have occurred in the last two years, most notably the replacement of Railtrack by Network Rail, and more strategic direction from government. The majority of this paper discusses research carried out in 2001 and 2002, and refers to Railtrack as the Infrastructure Manager. Section 5 describes subsequent changes.

2.2 Privatisation and Competition

The UK railway was privatised in stages from 1994, following the Railways Act of 1993. A number of different models were proposed, with the aim of fostering competition and reducing costs. This followed the privatisation and deregulation of the bus industry from 1986, which allowed new operators to compete with existing services, and enabled innovations such as high frequency minibus services to take root (White, 1995). While the early stages saw a rash of new services and operators keen to compete with each other, passenger uncertainty from frequent fare and timetable changes accelerated the long term decline in passenger numbers.

Many accounts of the privatisation process have been published, and the events and political manoeuvrings will not be discussed here. The fact competition had been introduced to the bus market was seen as a good thing by government, who wished to replicate this on the railways. It was also hoped that government spending on rail could be reduced, with the most profitable routes freed from government control entirely. A number of different models were proposed for the privatisation of British Railways, which itself was formed in 1948 by nationalisation of four major railway concerns known as the Big Four.

The simplest option was to privatise British Rail as a separate entity, but with the advent of EU Directive 91/440 (European Economic Community, 1991) requiring the accounting separation of railway infrastructure and operations, and the organisational separation of Banverket (infrastructure) and SJ (operations) on the Swedish railway (Harris & Godward, 1997), it was finally decided to adopt a similar model here, albeit with the 25 British Rail passenger units franchised out individually, and six freight units which would be sold outright to the private sector.

Two main modes of competition would be enacted under the new structure: competition for the market, where potential operators would compete in their bids to run the franchise, usually at the least cost or with the largest amount of proposed investment, and almost always with a declining subsidy profile. There would also be competition in the market, where operating areas of two or more TOCs overlapped, they would compete on fares and service levels (although there was a requirement for most tickets to remain interoperable between all operators concerned). A limited amount of open access competition occurred where operators were allowed to extend their services

into one another's territories (Hass-Klau and Environmental & Transport Planning, 1998), although this did not occur often as protection was given to TOCs (intended to be only for a transitional period) and enforced through the access agreement regime by ORR (Office of the Rail Regulator, 1998a).

A web of legislation ensures franchised TOCs deliver on their obligations as providers of a public service. In addition to the minimum service levels in the Passenger Service Requirement (PSR), there are targets for train punctuality (a reliability indicator refers to percentage of timetabled trains run, although in this paper the term refers to punctuality and operating performance. There is also a target for overcrowding, Passengers in Excess of Capacity (PIXCs) applied for commuting to London and Edinburgh.

3. TIMETABLING IN THE UK

3.1 What is a timetable?

The timetable is in reality a package of documents which describe the planned passage of trains across the network. The timetable itself, expressed in the Train Service Database (TSDB) is the core component, but it is dependent on several other documents, and yet more documents need to be produced from it in order to run trains, such as rolling stock diagrams and crew rosters. Figure 2 shows the data flows and dependencies in the timetabling process.

The Public and Working Timetables are the core outputs from the process (the public timetable containing only the times trains stop at stations). These are produced twice a year, currently in May and September, although from 2003/2004, there will be a single major timetable change in December across the whole of the European Union (European Union, 2001). The research described in this paper deals solely with these twice yearly changes.

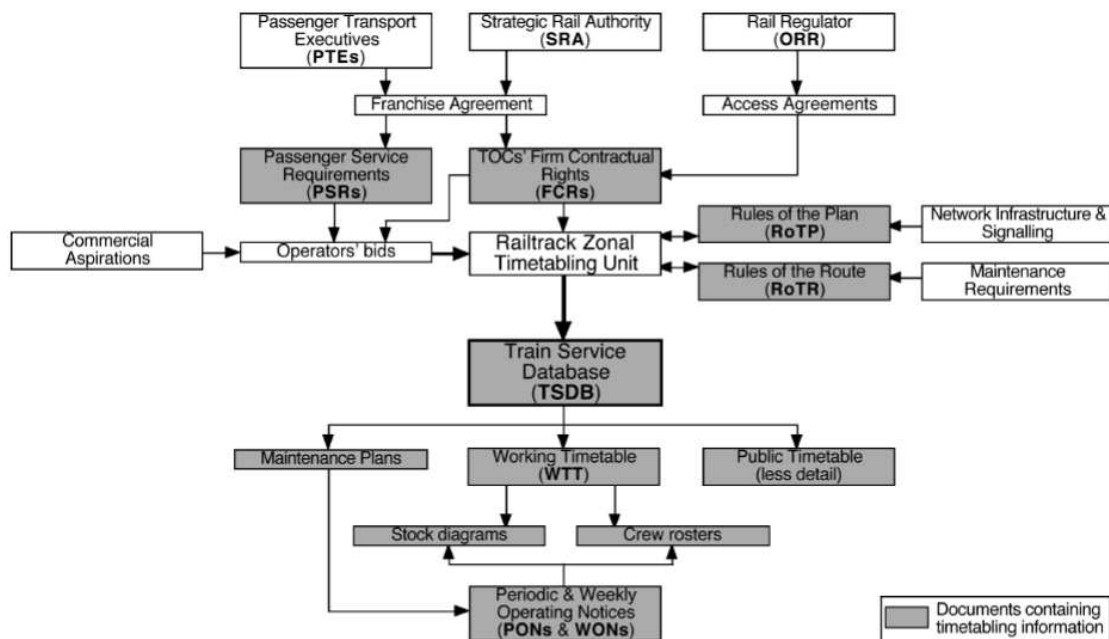


Figure 2. Main data flows in the timetabling process

3.2 Timetabling and Privatisation

Prior to privatisation, British Rail had been organised on a sectoral basis, with clear levels of priority. Main InterCity services formed the backbone of the network, and were first to be timetabled. Remaining capacity was then offered in order to Network SouthEast (London and South Eastern passenger services), Regional Railways (passenger services elsewhere), parcels and finally freight (Watson, Gillingwater & Boodoo, 2003). At privatisation, it was decided that there should not be an automatic right for InterCity trains to be “first on the graph”, and that a freight train had as much right to capacity as an InterCity train or a local service. All trains were then to be treated equally.

The original intention at privatisation was to mimic what had become the bus industry norm in the late 1980s of frequent timetable changes, able to quickly react to demand and develop new markets through innovative services. There was to be a new timetable every eight weeks, with a rapid timetable production cycle to enable feedback to be made from previous performance (although at this stage, it was financial performance that was the primary focus rather than operational performance). However, constantly changing bus timetables had been confusing for passengers, and a six week notice period was required for informing passengers of impending changes. For the railways, it was decided to adopt a 12 week notice period, as long journeys are often prebooked (Department of Transport, 2001) .

Eventually, it was realised that a timetable change every 8 weeks would be impractical and impose an undue amount of work upon train planners. A modified version of the existing timetable planning system was therefore adopted, with timetable changes in May and September. A framework to cover altered timetables during engineering works was also devised, also with a 12 week notice period to the public, known as the “Informed Traveller” timescale.

With operations split between franchised passenger TOCs and outright owned freight operators together with a hands off franchising authority (the Office for Passenger Rail Franchising or OPRAF), Railtrack was the only party with a national view and long term outlook. It was expected to take the lead in timetabling and capacity allocation, and act in the best interests of the industry, as these would also be its best interests in the long term, sustaining the network's usage and development.

3.3 The timetabling process

In April, Railtrack sets the planning rules by which the timetable will be constructed for the coming year. The Rules of the Route contain information on engineering work, and the Rules of the Plan contain information on the gaps between trains (headway) allowed in planning. Train planning begins in earnest 58 weeks before the timetable is due to start, with each operator preparing a bid to Railtrack. Railtrack collate all bids, which are made “blind”, as consultation between operators on proposed timetables is seen as collusion and anticompetitive. An offer is made, containing the changes necessary to accommodate all bids and ensure compliance with the Rules of the Plan.

Operators then reply to the offer with a second bid, and the bids are again collated. There is then an appeal procedure if they feel the second offer is

unsatisfactory, and a time period in which the appeals are conducted. The timetable is then finalised and uploaded to the Train Service Database 16 weeks before commencement, for dissemination and the production of rolling stock diagrams and traincrew rosters. The bids have to be prepared within a 4 to 6 week timescale, and Railtrack then has 6 to 8 weeks to respond with each offer.

Freight trains are typically planned over much shorter timescales, with coal trains subject to weekly programmes and some general freight trains operating on a spot bid basis, with a three day planning horizon. Outline bids may be made at the main timetable planning stage, but the availability of capacity on the network for freight still remains a contentious issue as priority is given to those trains which can run to a fixed timetable.

What sets timetabling and capacity allocation on the UK network aside from that on other privatised railways is the extent to which the process is devolved to individual operators, and the bottom up approach of bidding for timetable slots to the Infrastructure Manager rather than the top down approach adopted (for passenger services at least) in many other countries, whereby, through the Infrastructure Manager, capacity is allocated on a hierarchical basis. In the UK, the principle that “everyone is equal” is a major influence on timetabling and operating decisions.

3.4 Post privatisation change

The process as established at privatisation was contentious, and it proved difficult to produce a reliable timetable when all operators were bidding “blind” and unable to see what others were proposing. Railtrack changed the process to include a timetabling conference each June, where bidders made their outline proposals clear (although operators could still claim commercial confidentiality on their proposals). This covers the timetables commencing the following May and September.

Bidders have three weeks following the conference to formalise their bids, and 14 weeks elapse before Railtrack’s provisional offer is made, with all bids collated. Operators then only have three weeks to respond, and a final offer is made 24 weeks before the timetable is due to commence. There is then six weeks for bidders to lodge an appeal if they feel the offer is unsatisfactory, and the timetable is made available to the public 12 weeks in advance. The diagrams for rolling stock and crew rosters have to be produced, and final amendments are actually made within this period, up to 3 weeks before the timetable is due to start.

The timetabling process takes the outline specification expressed in franchising to the detailed level required for operating, sometimes with amendments to individual trains to take account of engineering works or poor operating conditions. Figure 3 shows the timescales involved in the process of producing the main twice yearly timetable, and the amended timetables required for engineering works.

Freight operators have to make an outline bid based on the traffic they perceive as being operated over the timetable period. Often this will differ wildly from the service actually run, so traffic such as coal, which varies on a week to week basis, involves obtaining paths over all the routes which are expected to be used.

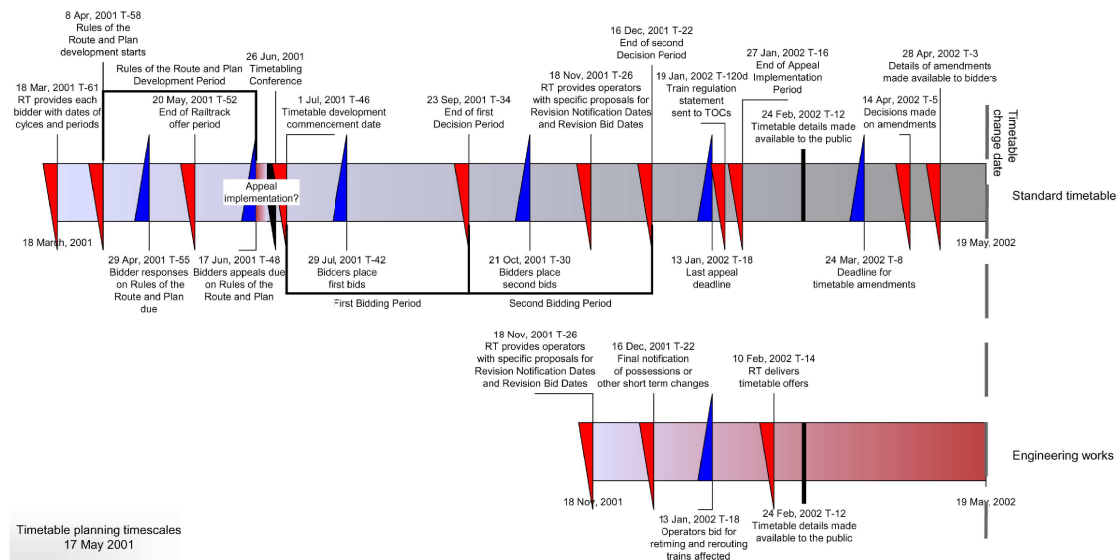


Figure 3. Timetable planning timescales, Summer 2002 timetable

3.5 Decision Criteria

In the bidding process, Railtrack collates each operator’s bid, which is made on the basis of its own aspirations and the information revealed by other operators at the conference. Every train is to be treated equally, there is no formal priority for any type of train as there was prior to privatisation, or indeed in most other countries, where long distance InterCity trains have first priority, followed by express services, local services and finally freight.

To assist Railtrack in deciding who should take precedence if two bidders ask for a path at the same time or crossing the same junction, there is an agreement as part of Railtrack’s Track Access Conditions (Railtrack, 2002), which are carefully regulated by ORR. Condition D4 contains 12 decision criteria, all of equal precedence, for deciding on the priority to be applied to bids for paths which also carry equal weight. The twelve Decision Criteria which Railtrack is required to apply are given in the appendix.

Railtrack effectively took the lead in the timetabling process, and it was largely their decision as to the allocation of paths in the timetable, subject to the overarching decisions on rights of access to the network in the first place, and the appeals procedure, both run by ORR.

4. IMPACT OF THE INDUSTRY ON THE PROCESS

4.1 Objectives of the timetabling process

The UK railway industry comprises a number of parties, each seeking their own aims and objectives from the timetabling process. The ORR have laid down their own objectives which they perceive should be applied by Railtrack and the operators (Office of the Rail Regulator, 1998b). These are

- To best meet the needs of passengers and freight customers
- To optimise capacity usage
- To preserve network benefits and connections

- To deliver accurate and timely information about services
- To achieve stability and deploy resources efficiently
- To facilitate maintenance and renewal
- To facilitate an appropriate level of competition

However, against this regulatory backdrop, Railtrack aims to sell capacity on the rail network to improve its profit, and the operators also aim to organise their services in order to maximise their own profits, focusing on meeting their contractual obligations for service provision and towards the most profitable markets.

This process has led to an increase in train kilometres run as operators extend the policy adopted by British Rail in the 1980s of replacing infrequent long trains with more frequent and shorter trains (known as “Sprinterisation” after the units introduced with the policy).

In order to assess the objectives of the timetabling process in the UK, in a project funded by the Engineering and Physical Sciences Research Council (EPSRC), a series of interviews was carried out with various stakeholders in the timetable. These included passenger operators from the former InterCity, Network SouthEast and Regional Railways groups, Railtrack, a PTE, the SRA and the Rail Regulator. The interviewees held various positions, from timetablers working on the mechanics of the timetabling process, to staff in management and strategic roles.

The interviews were carried out during late 2001 and early 2002, and span a key event in the industry with the financial collapse of Railtrack. Subsequent changes to the industry and timetabling process are discussed in section 5. Please note that only one representative from each type of stakeholder was interviewed, with the exception of InterCity operators where there were two. The results therefore do not necessarily represent views held across the industry.

4.2 Objectives of parties in the process

The ex InterCity operator interviewed operates long distance high speed services. Like most operators, passenger and freight, the parent company is a plc with shareholders to satisfy. The company aims to increase profitability by providing a high quality product, with an offer of a reliable, consistent and robust train service, and being distinctive in terms of its approach. It is aiming to be able to plan longer term, over a 2 to 4 year horizon, in order to meet future demands, and subsequently be able to offer bookings further into the future than possible at the moment. The operators need to satisfy other stakeholders, such as the SRA and local business communities on their network. They would like to be more demand led in terms of developing business opportunities, rather than production led on the basis of having to maximise usage of assets, although this remains a key priority in itself.

The former Network SouthEast operator, whose business is mostly commuter rail services into London as well as providing some express and other local services, is one of a number of operators who have been removed from the standard franchising model and effectively placed under a management contract. While many of these were franchises which financially collapsed as a result of not being able to meet optimistic forecasts in terms of subsidy reduction, this operator’s two main route groups have been split operationally and financially pending a change in the franchise geography. It aims to make

money within the provisions of the licence, which include a profit cap. However, the operator complained that the overall business objectives don't always trickle down into the timetabling department. Meeting the statutory 12 week "Informed Traveller" timescale was also seen as important. Being focused on providing commuter services, other key objectives related to being able to carry as many passengers as possible on as few trains as possible (in order to minimise costs), while providing a frequent enough service to attract passengers. The key to this was seen as being a standard hour timetable with more trains added at peak times.

The Regional Operator operates a core network of express services connecting major cities, commuter networks sponsored by Passenger Transport Executives, and other local and rural services, which tend to be heavily lossmaking. Overall, the operator relies on a large subsidy, and is also technically under licence following the collapse of the original parent company. It again aims to maximise revenue, but is more focused on reducing costs through savings on driver and conductor diagrams. There is still the desire to run a reliable service, but to do it at the lowest possible cost. Meeting the timetabling timescales and compliance with the Passenger Service Requirements (PSRs) are also mentioned as being important.

The freight operator reveals similar overriding objectives, to provide a good return to shareholders and maximise resource utilisation. There is also a realisation that the company's own internal objectives are not necessarily those of its customers, so balancing the two is a key part of being able to deliver a service the market wants while remaining profitable.

Railtrack again echoes the operators in seeking to maximise revenue and minimise costs, like the operators it is a profit seeking business. Revenue is maximised by selling track access, which accounts for 95% of the company's revenue. It therefore has to deliver against a variety of contracts, particularly the Decision Criteria (Appendix), to meet the aspirations of operators, to secure time availability for maintenance, to improve train performance through a robust timetable, to enable new traffic flows, to ensure there is a benefit for the railway as a whole and its end customers, and to mitigate potential safety risks within the timetable.

The Passenger Transport Executive (PTE) is a public body serving the needs of a major conurbation. Its remit covers all forms of local public transport and it aims to maximise use of the rail network to relieve road congestion. It sets the PSR at the franchising stage, but can change it if necessary, and can provide funding at a local level from Council Taxes. It plans to develop the local rail network with more peak trains, better connections between trains and a regular, clockface timetable (with departures at the same minutes past each hour). Its financial constraints lead it to seek the best service for the least amount of money, which is partly secured through better fleet utilisation - PTEs typically own or lease rolling stock and can specify their use.

The Strategic Rail Authority (SRA) has its objectives set in the government's 10 Year Plan for Transport (Department of Environment, Transport and the Regions, 2000). These are to grow the role of the railway for both passengers and freight, reduce overcrowding on trains to acceptable levels (the SRA sets targets for Passengers In Excess of Capacity (PIXCs)), and ensure the needs for good operating performance and maintenance of the network are considered.

The Rail Regulator is an independent regulatory body whose primary function is to regulate Railtrack's monopoly on the national rail infrastructure. It

ensures Railtrack delivers its objectives, and oversees disputes over track access. It ensures the practicality of track access proposals put forward by operators, and can rule to allow or reject open access plans by franchised TOCs beyond their boundaries or non franchised operators. They also make sure the arrangements for timetable development are appropriate. They also have remits to promote competition but also to ensure efficient use of the network.

4.3 Contention and Competition

Operators compete for paths between themselves for a variety of reasons, to gain a commercially significant arrival or departure time (such as on the hour or clockface), to obtain the fastest possible journey time, or for scarce capacity on a station approach, major junction or long signalling section.

As well as this, passenger operators compete through ORCATS to obtain a larger share of revenue on route sections they share with others. ORCATS, or Operational Research Computer Allocation of Tickets to Services, was developed by British Rail to divide revenues between InterCity, Network SouthEast and Regional Railways. Because accurate allocation was not necessary, ORCATS was a rough and ready tool, but continued in use after privatisation. Many operators learnt to exploit the way ORCATS works to run trains at particular times, or alter routes to pick up sections with high revenues, this is known as an "ORCATS raid".

Contentions occur between operators and the public sector bodies responsible for the industry, the PTEs and Strategic Rail Authority. Operators' contentions with the SRA include a lack of strategy accompanying its role as the key government agent in the railway. However, it has a remit to support growth and deliver the government's 10 Year Plan for Transport. It also ensures delivery against its payment of subsidy, although this usually is not a major contention. There is some annoyance that the SRA attends the Timetabling Conference as an observer, but will not provide direction. The PTEs are seen by other operators, such as InterCity and freight, as unfairly prioritising local services and local needs to the detriment of national objectives.

The contentions between the operators and Railtrack are more immediate in terms of timetabling and operations, and operators accuse Railtrack as being wholly focused on profit, although one pointed out profit is associated with the ability to reinvest in the railway. Railtrack's rules in the timetabling process, and their ability to change them at short notice are important contentions with the operators. It is seen, however, that Railtrack's customer relations with the operators are often poor, and the company is intent on sweating its assets and focusing on its property arm, which is perhaps easier to make a profit with. Strangely, these concerns reflect Railtrack's about the operators, focused on making profit and maximising asset usage. Thus the normal business objectives of both sides conflict because they are buying and selling the same asset in track capacity, both wanting to gain the most advantageous position. However, in delivering the possibility of shorter journey times and improving the robustness of timetables, Railtrack and the operators are aligned in their desires. Railtrack is seen as wanting to sell more paths to maximise its own shareholder value, though the contentions between Railtrack and the SRA's roles were not investigated. Internally, Railtrack has to make tradeoffs between profitability and maintaining the network, between selling paths and maintaining spare capacity to deal with perturbations in

service, and between allowing operators to run more early, late and Sunday services and allowing maintenance access to the network.

The PTE as a public sector body is involved in the funding and specification of local rail services, and ensures compliance and delivery from local service operators. Its main contentions are with express passenger services and freight trains, where the local objectives of the PTE conflict with others. Usually, the PTE does not allow its own services to be changed. There can be similar contentions with what the SRA want, as they are taking a more proactive role in management of the railway.

The interviews were carried out in 2001, before the SRA had fully adopted its strategic role (changes in the SRA's role are discussed in section 5). The SRA ensures that the franchised train operators deliver on their contracts. It sees the operators as trying to make a good rate of return, and that some will work solely on doing the minimum they can to fulfil their contracts, while others will try to go further and provide other services and benefits to their passengers.

The Rail Regulator also considers that the operators fall into two camps in terms of attitude. Those with a longer term outlook will focus on customer service, while those with a short term outlook focus on cost cutting. InterCity operators are incentivised to run more services, as these are generally profitable, while Regional Railways operators can often benefit from running less services in some areas, they have fewer profitmaking services to begin with, and rural lines tend to require very large subsidies and lose large amounts of money. Railtrack is seen as having to comply with company law, where a company's first duty is to its shareholders. While Railtrack optimises bids for timetable slots, it is not incentivised, and so does not benefit from effective timetabling itself. In providing for local transport needs with services seen to be major capacity users, the PTEs conflict with the ORR objectives of efficient capacity allocation.

4.4 Perceived deficiencies

All the parties involved identified deficiencies in the system. Almost all pointed to the SRA's lack of strategy, something which has since been remedied (see section 5).

The InterCity operator found there was a problem in trading off between local and national needs, important because of its secondary role in providing long distance commuter services. It also identified an overemphasis on political needs from the SRA, as an agent of government, as well as a rigidity in the Passenger Service Requirements that meant enhanced services could fall foul of it on the technicalities of serving intermediate stations or maximum journey times (the Regional operator saw the same issue affecting its express services). There was also a sense of disintegration with the planning process with the development of commuter housing along the network. The business saw itself as disintegrated, with timetabling, fleet planning and financial planning horizons all out of step, making integration of financial and operational planning difficult. Management culture at Railtrack is blamed for being poor and customer unfriendly, and not being on top of engineering planning.

The Network SouthEast operator was concerned with the timetabling process, which overworks timetablers for a few weeks a year, and Railtrack's overemphasis on profit.

The freight operator was concerned about Railtrack's lack of strategy other than running the railway on a day to day basis, and its seeming focus on its property portfolio rather than running the railway.

Railtrack feels that the financial structure of some franchised operators incentivises them to cut costs, which can produce differently structured timetables, and that in some cases, operators seek payouts as compensation for poor service performance, rather than focusing on developing more robust timetables.

From the PTE's perspective, the deficiencies largely relate to the SRA, which has taken some of the funding and service specification powers from them, and also would prefer not to spend money. The SRA blocks infrastructure service enhancement proposals from PTEs, where it feels the proposal is not in the best interest of the railway (Sully, 2001), whereas under British Rail, these improvements were easier to make.

The Strategic Rail Authority finds deficiencies in Railtrack's inability to determine the level of capacity available, and their trying to sell too many paths to maintain a reliable network, both in engineering and operating performance.

The Rail Regulator sees that rail operators are not necessarily incentivised to provide good customer service, and that there is often not a connection between the operator's customer service record and passenger loadings (for most journeys, the franchised TOC is a local monopoly in any case). It sees PTEs as taking capacity which could be used for other services, and that Railtrack is deficient in its own organisational setup, which requires it to serve its shareholders first.

The way the process works is seen as deficient by almost all the stakeholders. Although the development of a timetable takes so long that it has to begin before the previous year's timetable starts, from the operators' perspective, there is not enough time to produce the bid for Railtrack. Railtrack does not always meet its deadlines (and nor do the operators), and in disputes and changes in agreements, both the SRA and ORR can make decisions outside the normal timescale. Even from Railtrack's point of view, there is only the time to collate and alter bids to fit, and not enough to optimise the timetable, a problem which it is hoped improved IT tools will solve in the future. There is also no agreed measure of capacity, every operator considers their own trains as the "base", with faster or slower trains seen as consuming excess capacity.

5. RECENT CHANGES

5.1 Industry structure – The role of the SRA

In October 2001, Railtrack was placed into a special administration under the Railways Act as a result of a catastrophic rail failure a year earlier, followed by a programme of widespread rail replacement which nearly bankrupted the company. In 2003, Network Rail took over Railtrack's infrastructure. Unlike Railtrack, its shares are not traded on the stock market, and operators and other interest groups are stakeholders. It remains to be seen what real difference Network Rail will make.

A key change to the industry structure which has affected capacity allocation profoundly has been the setting up of the SRA, to “create a clear, coherent and strategic programme for the development of the railways and provide a single body accountable to the Secretary of State for strategic planning, coordinating and supervising the activities of the rail industry and for the disbursement of appropriate public funds” (SRA, 2003a). In particular the SRA was required by government in its Directions and Guidance to develop a policy for the utilisation of network capacity. (SRA, 2001).

The SRA has spent since the beginning of 2002 considering how it can achieve better capacity utilisation. It has now published several documents which set out its position: its Capacity Utilisation Policy consultation (SRA, 2002a), Statement of Principles (SRA, 2002b), Network Utilisation Strategy (SRA, 2003c) and its first route specific study, the Midland Main Line Route Utilisation Strategy consultation (SRA, 2003b). In addition it has published its Strategic Plan (SRA 2002c, 2003d), setting out its wider objectives and plans and its Appraisal Guidelines (SRA, 2003e), which set out how different options will be judged (all these documents are available from the SRA website at <http://www.sra.gov.uk>). The SRA has reviewed how much freedom it gives franchisees to set their own timetables and for all new franchises, franchisees are required to get SRA’s approval before seeking access rights or bidding for specific paths. This helps SRA to work towards more effective use of network capacity – but clearly reduces the extent to which there is competition between train operators.

With the introduction of the Capacity Utilisation Policy (CUP), there is now a clear paradigm for timetable development is shown in figure 4. Capacity is allocated long term through the Capacity Utilisation Policy, according to a primary purpose (which may be express or local passenger, or freight on some routes). This is then translated into Firm Contractual Rights on an operator basis, and worked through the existing timetabling process to refine the allocation and the remainder of the Operational Plan.

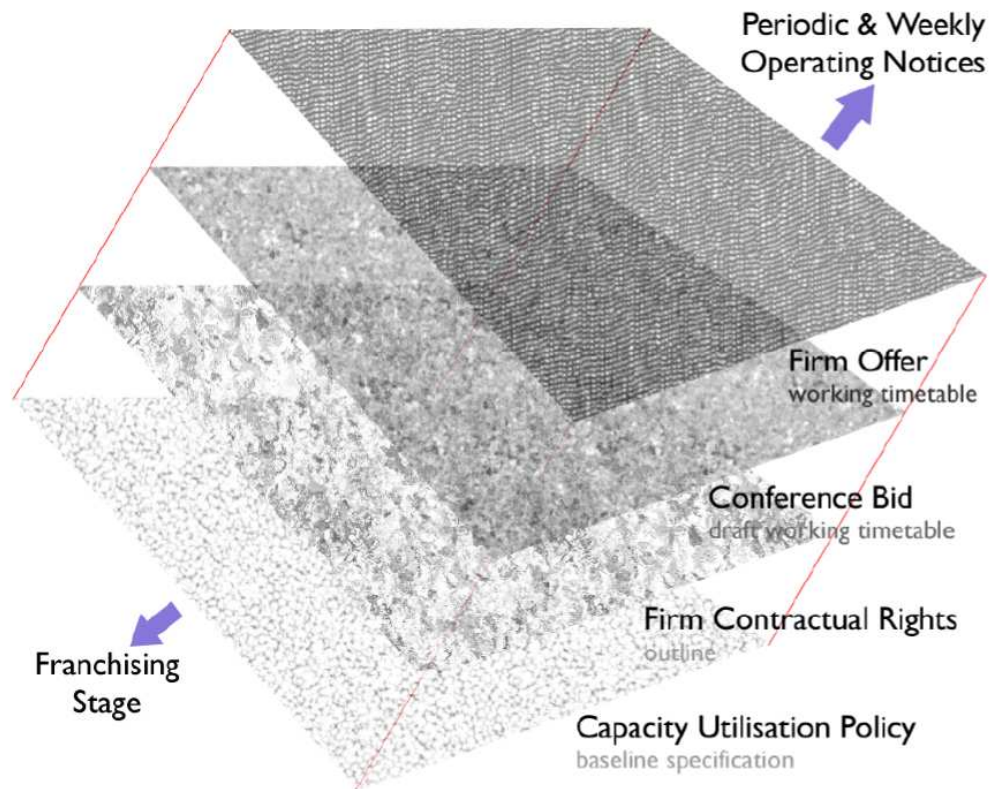


Figure 4. Increasing levels of detail in the timetabling process

5.2 Implementing 2001/14

Directive 2001/14/EC of the European Parliament and of the Council of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (European Union, 2001) sets out, amongst other matters, how capacity should be allocated between train operators. The document substantially follows current UK practice and hence discussion about implementation has focused on whether any minor changes to process or responsibilities might be required. Currently the Department for Transport, SRA and ORR are finalising details, in particular seeking to ensure clarity of roles between SRA, ORR and Network Rail. There appears to be a view that the SRA should not be the Infrastructure Manager for the purpose of capacity allocation, as it is considered more straightforward if SRA is clearly an arm of government carrying out the roles that the directive gives to central government, including reviewing the infrastructure manager's plans for capacity enhancement and deciding whether funds are available for capacity enhancement. Network Rail therefore remains as the Infrastructure Manager responsible for producing a Network Statement detailing the requirements for operators to gain access to the network.

Of more significance to the UK has been the amendment made to Annex III of the Directive, moving the timetable change date to December. This is causing considerable transitional problems, with three major timetable changes required during 2004 (May, September and December). This will stretch the available timetabling resources to the limit.

6. CONCLUSION

6.1 Impacts of the industry structure

The breakup of the UK rail industry into a series of train operators and a primary Infrastructure Manager (in the form of Railtrack, now Network Rail) has formalised relationships which existed prior to privatisation, but were hidden beneath a supposedly unified organisation. Contentions between parts of the business, such as between freight and InterCity, or between BR and external organisations such as the government and PTEs, have been brought into the open. There is an organisation responsible for each type of traffic, as well as the infrastructure, and everyone has an equal chance to make the case for their services, whether passenger or freight. However, this externalisation of relationships has also slowed down changes, and made it harder for some organisations, such as PTEs, to have an active input into the timetable. Operators themselves are striving for different objectives and targets, such that, without an overriding strategy from either Railtrack / Network Rail or government (in the form of the SRA), the goal congruence required for the industry to move ahead in any way does not exist, and cannot be organised.

Internally, contentions still exist within each organisation, such as between operational and financial planners, who may have different objectives for the company. These are not often recognised, so will be harder to resolve.

The Infrastructure Manager has a pivotal role in the timetabling process, and was expected to take a strategic view of the whole industry, while also being a stockmarket listed company. This created its own contentions, both inside and outside of Railtrack. Network Rail has removed the short termist demands of the stockmarket, but still remains the focal point of timetabling. Network Rail being late with timetabling decisions can still lead to a disaster in operators' resource scheduling.

The Strategic Rail Authority has assumed its strategic role, with a series of plans for the operating of the railway. The combination of the bottom up approach of planning by operators will have to fit with the newly reinstated top down approach of the SRA, and it is hoped the combination of feeding in government and industry level objectives from the top, and local and individual commercial objectives from the bottom, can create a balance which benefits interests on both ends.

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APPENDIX (Railtrack's Track Access Conditions, February 2001)

ACCESS CONDITION D4 - DECISION CRITERIA

The Decision Criteria consist of the necessity or desirability of the following (none of which necessarily has priority over any other):

- a) sharing the capacity, and securing the development, of the Network for the carriage of passengers and goods in the most efficient and economical manner in the interests of all railway services having regard, in particular, to the safety, the effect on the environment of the provision of railway services and the proper maintenance, improvement and enlargement of the Network;
- b) enabling a Bidder to comply with any contract to which it is party (including any contracts with their customers and, in the case of a Bidder who is a franchisee or franchise operator, including the franchise agreement to which it is a party), in each case to the extent that Railtrack is aware or has been informed of such contracts;
- c) maintaining and improving the levels of service reliability;
- d) maintaining, renewing and carrying out other necessary work on or in relation to the Network;
- e) maintaining and improving connections between railway passenger services;
- f) avoiding material deterioration of the service patterns of operators of trains (namely the train departure and arrival frequencies, stopping patterns, intervals between departures and journey times) which those operators possess at the time of the application of these criteria;
- g) ensuring that, where the demand of passengers to travel between two points is evenly spread over a given period, the overall pattern of rail services should be similarly spread over that period;
- h) ensuring that, where practicable appropriate provision is made for reservation of capacity to meet the needs of Bidders whose businesses require short term flexibility where there is a reasonable likelihood that this capacity will be utilised during the currency of the timetable in question, or where Train Slots may require amendment following a European Timetable Change Date;
- i) enabling operators of trains to utilise their railway assets efficiently and avoiding having to increase the numbers of railway assets which the operators require to maintain their service patterns;
- j) facilitating new commercial opportunities, including promoting competition in final markets and ensuring reasonable access to the Network by new operators of trains;
- k) avoiding wherever practicable frequent timetable changes, in particular for railway passenger services; and
- l) taking into account the commercial interests of Railtrack and existing and potential operators of trains in a manner compatible with the foregoing.

In its consideration of paragraph (d) of this Condition D4, Railtrack shall not be entitled to determine that its possessions of any part of the Network shall be as contemplated by any relevant maintenance contract by reason only of the terms and conditions of that contract. In this paragraph, "relevant maintenance contract" is a contract which Railtrack shall have entered into, or shall enter into, with any person for the maintenance, renewal or the carrying out of any other work on or in relation to the Network.