Published paper

Fowkes, A.S., Nash, C.A. (2004) *Rail Privatisation in Britain - lessons for the rail freight industry* - ECMT Round Table 125, European Integration of Rail Freight Transport

---

Rail Privatisation in Britain – Lessons for the Rail Freight Industry

Tony Fowkes and Chris Nash
Institute for Transport Studies, University of Leeds

1. Introduction

Until 1994, the rail industry in Britain – as in most of Europe – was organised in the form of a single integrated state owned company providing passenger and freight services, and the infrastructure on which they ran, throughout the country. It is true that significant reforms did take place in the 1980s, grouping rail services into a number of sectors (Inter City, London and South East and regional passenger, and trainload, distribution and parcels for freight) with their own objectives, management and accounts (Nash, 1988). Also activities such as hotels and rolling stock manufacture were hived off and privatised.

However, by the early 1990s the government was determined to go further and privatise the entire rail network. After much debate about options they determined on a pattern that had come to be seen as the norm for network industries – a regulated monopoly infrastructure provider with competitive operators using it. The infrastructure was placed in the hands of a new infrastructure company, Railtrack, which levied charges to cover its costs and was subsequently privatised. Operations were divided into a number of separate companies and also privatised. However, for a mixture of good and bad reasons they were not willing – at least initially – to leave the question of what passenger services would be provided at what charges up to the market. Thus passenger services were franchised out, with franchise requirements as to minimum levels of service and regulation of some fares.

In the case of freight services, the approach of the government had long been that services should be run on commercial principles, with specific subsidies for flows of traffic which would otherwise use road and where this would impose sufficient social costs that the subsidy was justified. This was essentially the approach carried through into privatisation. Thus the policy for freight was to implement complete open access for any licensed train operating company, and to seek to create a number of competing freight operating companies by splitting up and privatising the former freight business of British Rail.

This paper will proceed as follows. First, the history of rail freight privatisation in Britain will be charted, sector by sector. It will be seen that there has been relatively little entry into the industry, and the reasons for that will then be explored. The particular issues of the price and availability of track access, and of the availability of government grants will then be discussed. Prospects for the rail freight business in Great Britain are then considered. Finally we draw together some lessons which may be learned for other countries embarking on the privatisation and/or deregulation of rail freight. An appendix presents detailed estimates of trends in rail and road freight in Great Britain.

2. The privatisation process

Table 1 presents some data on the volume and profitability of rail freight in Great Britain for the year to 31st March 1992 (i.e. directly prior to the start of the privatisation process) which we have grouped in order to aid an understanding of what happened. The grouping codes and titles are our own, there being changes over time to official nomenclature.

Table 1 British Rail freight Data for the year to 31/3/92

Group	Title	Tonnes (million)	Net Tonne-km (million)	Turnover (£ million)	Profit (£ million)
A	Mail and Parcels	N.A.	N.A.	101.5	-34.7
B	Less than Trainload	15.2	2421	174.9	-118.7
C	Trainload	120.6	7115	505.3	+67.5
D	Infrastructure	N.A.	N.A.	N.A.	N.A.

N.A. = Not available

Source: BRB (1993) annual report and accounts

It will be noted that the data is not complete, as will be explained below, and that profitability varied by grouping. Two points leap from the table. The first is that a commercial firm will only take on one of the loss making groupings if there were prospects of making it profitable, or if there were to be a subsidy in some form or other. Given the scale of losses in the less than trainload business, the government would almost certainly have either to face up to a large reduction in rail freight in this sector or to provide direct subsidies. The second is that any commercial firm operating in or entering the rail freight market will seek to move to increase its operations in grouping C, regardless of the firm's name or history, unless prevented by controls. Consequently, if the government were to permit more than one rail freight operating company, competition would reduce prices for trainload traffic and remove the cross subsidy from that to other forms of traffic. Transitional arrangements and the lack of a strong second hand rolling stock market could moderate the position for a few years.

In preparation for privatisation, the government ordered a major pruning of unprofitable freight services, with the objectives being that all traffic should earn at least a 5% rate of return on capital employed. Nevertheless, some of the businesses were still in a serious financial position at privatisation.

We will turn now to discuss the traffic groupings in turn.

A. Mail and Parcels

Historically much of this traffic was conveyed on passenger train services, so sharing much of the cost. Parcels might be recorded by number rather than exact weight, and major contracts might state volumetric requirements rather than weight. In consequence the tonnes and tonne-km data is not very reliable. In 1971 there had been 13.4 million specially run train miles. By the beginning of the 1990s many customers, notably the newspapers, had deserted rail. Some 150 dedicated trains were run each night, with the Post office having an option to carry mail on around 3000 passenger trains each day. In 1991 the operation was relaunched under the brand name Rail Express Systems (RES). A new contract with the Post Office saw the end of the carriage of mail by passenger train, simplifying the privatisation process. In December 1995, grouping A was the first part of the BR freight operation to be privatised, being sold to English Welsh and Scottish Railway (EWS), a grouping headed by the U.S. Wisconsin Central railway but largely owned by banks. EWS therefore took over the Post Office contract, which is due to last to 2010. EWS provided new locos in order to be sure of meeting the exacting performance agreement, and reduce operating costs. EWS have claimed that the Post Office contract is its most profitable; in 1999 it lifted some 300,000 tonnes of traffic. However, a safety requirement to withdraw the vans used for on-the-move sorting, together with network performance deterioration in the wake of the 2000 Hatfield train derailment, is currently resulting in a cutback in the number of services operated. Other than the Post Office contract, the activities of RES largely involve the hiring out of locomotives.

B. Less than trainload

The figures for this group in Table 1 are actually for what was then known as Railfreight Distribution. This comprised three parts:

B1. Domestic and Maritime Container operations undertaken under the Freightliner brand name;
B2. Wagonload traffic
B3. Non-bulk trainload services, principally automotive and edible products.

We will consider these three in turn, followed by a new traffic, B4, Channel Tunnel intermodal.

B1. Freightliner

The 1963 Report ‘The Reshaping of British Railways’(BRB,1963) is principally remembered for the large scale closure programme it proposed for passenger services and lightly used stations, both passenger and freight. However, the report sought to greatly increase the quantity of freight handled by rail. The principal method of attracting less than trainload traffic to rail was to be the Freightliner network of container trains. These were to carry 8 foot high containers in 10 foot, 20 foot, 30 foot and 40 foot lengths between a limited number of terminals, between 50 and 100 being envisaged, with road collection and delivery.

However, this density of network was never reached, and the whole operation became increasingly uncompetitive for domestic traffic as the road freight alternative became ever cheaper. Nevertheless, growth was initially good, with Freightliner becoming the

world's largest overland container haulier. By 1981 Freightliner operated 25 terminals and served 18 privately owned terminals, mostly ports. 200 trains were run each day moving over 800,000 TEU's p.a. However, the trading profit of £0.1 million on turnover of £72.1 million was insufficient to fund further expansion. Domestic traffic was gradually lost, being replaced by maritime boxes which only had to be collected/delivered at one end of the rail journey, thereby being more cost competitive with road.

By 1992, little domestic container movement remained. The profitability of moving maritime boxes was hindered by the increase in height of ISO containers, latterly to 9 foot 6 inches, which either required expensive route gauge enhancement or special low wagons having limited payload capacity. In order to improve profitability prior to privatisation, services were recast in 1992 into an essentially hub and spoke operation of roundly 80 trains per day. It was claimed that the business was making a loss of roughly half of its £70 million p.a. turnover (Abbott, 1994). Freightliner were then operating just nine terminals, and were serving just five privately owned port terminals.

It is understood that there was little interest in purchasing the company when it was offered for sale, and privatisation was achieved via a management buyout, which took control of the operations and assets in 1996. In order to induce the management to take Freightliner, a block £75 million Track Access Grant was offered to cover the charges raised by Railtrack to cover the period up to 2000.

Following privatisation, there was a 23% increase in traffic volume, and a modest profit was returned. In March 1998 Freightliner was awarded the title 'European Rail Operator of the Year'. The market for maritime freight movements is, however, dominated by the state of world trade, recent falls in which have been reflected in Freightliner's carryings. Crucial to the company's future success in this activity was re-negotiation of the Track Access Grant in 2000. In the event there was an unsettling delay, but the matter was resolved and a 'Company Neutral Access Grant' established, open to any company wishing to move containers, not just Freightliner. Indeed, after a wary start, EWS has been competing for container traffic. Conversely, there being little prospect of substantial profit from container traffic, Freightliner has moved aggressively (as we shall see) into the bulk freight business, and the infrastructure business.

B2. Wagonload traffic

By the 1980s, British Rail had become heavily concentrated on moving traffic in full trainloads, and there were calls for the complete abandonment of the movement of individual wagonloads as being inevitably unprofitable in a country where lengths of haul in excess of 500 kilometres are rare. During the 1980s BR instead tried to develop a new high quality wagonload service, branded Speedlink, to handle traffic which could not profitably be moved in full trainloads. By 1984 there were 150 daily trunk services serving 12 main centres and 12 secondary centres, plus a myriad of feeder services capable of reaching 800 sidings. Harris (1983) claimed that "At present, taken on its own Speedlink is profitable; this at a time when 40% of road hauliers have been operating at a loss". However, the basis for this calculation was not given, but is believed to have involved Speedlink charging its full cost to other BR

sectors for moving their traffic regardless of what the customer paid. Speedlink moved some 8 million net tonnes of traffic in 1984, but expansion then stalled, with some BR commodity sectors preferring to confine all traffic to their own trainload services. In late 1988, Railfreight Distribution (RfD) was formed from the amalgamation of Freightliner and the chemicals, automotive, industrial minerals, edible products, general merchandise and international activities, incorporating the Speedlink wagonload network (Freeman Allen, 1989). Little progress was made in gaining economies by merging Freightliner and Speedlink operations, partly due to their using a slightly different braking system. It was soon decided to close Speedlink, as having no prospects of becoming profitable, though some profitable domestic wagonload movements were catered for on a new network, Connectrail, set up to handle wagonload traffic moving via the Channel Tunnel. This residual wagonload traffic was privatised by sale to EWS along with the new Cross-Channel intermodal services (see B4 below), there being nobody else interested in purchase. EWS combined the Connectrail network with its own wagonload network (Enterprise), which had been set up by one of the trainload companies it bought. EWS were initially bullish about the prospect for its Enterprise wagonload network, and major traffic gains were made. However, Enterprise is still not a large operation, compared to Speedlink. In 1997 it moved some 1.5 million tonnes, and in 1999 some 3.0 million tonnes. In recent times EWS has sought similar financial support regarding its wagonload traffics as Freightliner has received regarding its container traffic, though the SRA did that on a company-neutral basis. Very recently, EWS have claimed that, at least parts of, the Enterprise network may be under threat as Freightliner have won a contract for one of the key commodities (Cement) moved in Scotland, without which the Scottish enterprise routes may be unsupportable. The future for wagonload traffic looks very uncertain.

B3 Non-bulk trainload services

These were included in the formation of Railfreight Distribution in 1988, as discussed in B2 above. In 1993, as RfD Contract Services, they carried some 6 million tonnes of traffic. However, they were particularly badly affected by the government's instruction that all railfreight movements should make a profit at least equivalent to a 5% return on capital. It was decided to transfer the remaining traffics to the trainload companies being formed for privatisation, as will be discussed in C below.

For reasons that are not totally clear, though said to be due to its European emphasis, automotive services were retained within RfD and privatised along with B2 and B4. In the event, European automotive services have not been as successful as hoped, and most of the specially built wagons have lain idle.

B4 Cross-Channel Inter-modal Services

These were introduced with the opening of the Channel tunnel in 1994, taking over traffic that was previously handled by Freightliner through Harwich. Substantial traffic growth was foreseen, partly via forecasts predicated on 84% on-time reliability and frequent service to a range of destinations, including Germany. In the event, service quality struggled to get anywhere near that which had been assumed, and German Railways routed traffic through German ports rather than via the Channel Tunnel. The situation was not helped by frequent strike action (most notably on

SNCF) and the closure of the tunnel for several months following a fire on a Eurotunnel freight shuttle. The diversionary possibility represented by the rail ferry between Dover and Calais had been quickly withdrawn.

The business was sold along with residual elements of B2 and B3 (largely automotive) to EWS in November 1997 after long negotiations, and awaiting EC approval of the financial arrangements. It appeared that there were no other serious bidders. EWS only agreed to take over these services if the, rather high, charge for using the Channel Tunnel was underwritten for 10 years, i.e. EWS were to pay zero tolls to use the Tunnel unless it more than tripled the freight it moved through the tunnel. After 2007 the deal BR made with Eurotunnel ends, and a new agreement will need to be negotiated.

Rail freight through the Channel Tunnel has never come close to what was forecast, and in the last year has collapsed, largely due to the problems of illegal immigrants boarding trains at Sangatte, leading SNCF to restrict operations to only a fraction even of the limited amount of traffic on offer.

C Trainload

Table 1 shows that this sector was where there was profit to be made from railfreight in Great Britain. However, at the time of privatisation the government did not wish to maximise its revenue from the sale by selling a monopoly to the private sector. Instead they wanted to introduce competition within the rail freight market, which would clearly result in any excess profits being competed away. To this end the trainload sector of BR was split up into three regional trainload companies, with a remit to compete with each other, and there was to be open access to the industry.

BR had made a profit from certain segments of the freight market where rail had a competitive advantage by charging a monopoly price as only one train operator was permitted. The trains themselves were often formed of privately owned wagons, and latterly even privately owned locomotives, but crews were supplied by BR, who determined the price for the movement. With competition, the monopoly rents were very largely competed away.

The three trainload companies began operating as separate entities in April 1994. Initially dubbed North Freight, West Freight and South-East Freight, they lost no time in rebranding themselves as Loadhaul, Transrail and Mainline, respectively. Locos were rebranded and many completely repainted, and some wagons were dealt with similarly. Each were allocated a number of flows from Trainload Freight's portfolio, as well as receiving some of Railfreight Distribution's Contract Services, see B4 above. Flows were generally allocated to the company in whose area the traffic originated, but the reverse was the case for Power Station coal, for which source of supply often varied at short notice. Each company was free to bid for new traffic in any area.

Underlying this method of privatisation was empirical evidence from U.S. railroads (Caves et al, 1987) that, beyond some 'minimum efficient size' there were constant returns to scale. There were, however, thought to be diseconomies of scope, a rather more vague concept. In this case, it was interpreted as suggesting that there were

benefits from a tighter geographic spread as well as a smaller range of activities and customers. It was therefore felt that a localized focussed open access operator might well be able to operate fully efficiently with only a handful of locos and trainsets.

In the event, there was strong argument from many within the industry that economies of scale were lost by having companies which, although strong in a particular region, would operate long distance flows into regions where they had little other traffic. When the three companies were privatised, the most attractive bid was for all the three companies from EWS, who merged them again as discussed in the next section.

C1 EWS

As discussed above, having been split into three regional companies, BR's former Trainload Freight sector was offered for sale. Each company's management was obliged to bid for their company and the two other companies. This yielded nine bids. A tenth bid came from the grouping that became known as EWS Railways. American railroads had been specifically targeted by the British government to bid for freight companies, and EWS had already acquired RES (see Section A above). They now checked with the Rail Regulator that they would be allowed to take over all three trainload companies together. Being given the green light they bid for them all as a job lot and were successful, taking over the three companies in February 1996. The expense of splitting the companies and rebranding was therefore wasted. The possibilities for competition were greatly reduced, and reduced yet further once EWS had acquired the European and residual domestic wagonload traffic described in section B above.

EWS were quick to re-equip with 280 modern U.S. designed locos and over 2000 new wagons. Anecdotal evidence suggests that there has been some improvement in service quality, and traffic growth further suggests that the privatisation was successful. However, profit at EWS was not high, and falls in Wisconsin Central share price led them to try to sell their share in EWS. Wisconsin Central was taken over by Canadian National in 2001, but no buyer for EWS has yet been found. In the meantime, service quality has deteriorated, particularly following the Hatfield accident, and some contracts have been lost to other operators. The future for EWS is therefore somewhat uncertain, although it will have been helped by the reduction in track access charges discussed in section 3 below.

The trainload traffic included in the data in Table 1 were latterly run by BR as four commodity subsectors of Trainload Freight. We now deal with each in turn.

A small amount of coal traffic in GB moved in wagonloads or containerloads for domestic or industrial use, but this was a declining traffic. Latterly it was managed as part of Trainload Coal. Also included in this sector was the nuclear traffic discussed in C2 below and later taken over by BNFL. Of the actual trainload coal, most was destined for the electricity supply industry. About half ran less than 50 kms, but was profitable due to the automated loading and unloading. The pit closure programme of the early 1990's, coupled with the associated 'dash for gas' greatly reduced tonnages carried. Initially, tonne-km fell too, but the longer hauls of imported coal from deep berth ports to inland power stations eventually reversed this, so that substantial growth in coal traffic materialised. This was facilitated by EWS losing little time in adjusting

its charging rates to competitive levels. As we will see in C3 below, National Power, who had set up an open access operation to carry coal to their Drax power station sold out to EWS in 1998. However, competition did arise, in the form of Freightliner who wanted to diversify into the potentially lucrative bulk freight market, using brand new locos and wagons. This competition appears to have stimulated traffic growth in this area.

The oil and petroleum sector of the market has been declining, partly due to competition from pipeline and partly due to the consequence of new safety measures. EWS initially had the market to itself, but latterly Freightliner have bid for contracts as they have come up and won a few, again using new locos, but this time hauling the company's own wagons.

Metals includes the movement of ore and limestone to blast furnaces, as well as finished and semi-finished products. GB steel production has faced difficult conditions, but imports have often been rail hauled. Where blast furnaces etc. have been closed, the flows of inputs have been lost to rail, and this is a continuing problem for rail. EWS concentrated on improving the quality of service for finished and semi-finished steel, ordering many additional telescopic hooded wagons to improve the service. The figures suggest that this has been successful.

Construction is subject to larger than usual cyclical effects since it relates more to investment than consumption. Much of the traffic is stone used in road schemes, the programmes for which have been speeded up or slowed down for political reasons. Prior to privatisation, most of the major stone flows in the south of the country were moved by an organisation now known as Mendip Rail. They own their own locos, wagons and maintenance facilities, but use EWS crews. They seriously investigated the possibility of becoming a fully fledged open access operator, but found it too difficult. It is presumed that EWS's charging policy has played a part in this decision. Freightliner have provided additional competitive pressure, securing most of the cement traffic.

C2 BNFL

Two companies did take up the challenge of operating trains to move their own traffic. One of them was British Nuclear Fuels Limited (BNFL) which had to move radio active materials around the country, with severe limitations on what could be moved by road. Most traffic was therefore captive to rail by law, and so BR were able to charge a profitable rate. BNFL envisaged increasing traffic levels and decided it could reduce its costs, and possibly gain an improved service, by forming its own train operating company, Direct Rail Services (DRS). Some locos that had been sold by BR for use in constructing the Channel Tunnel came on the market at the right time and these were purchased and some refurbished for use. The failure of the proposed Nightstar sleeper services through the Channel Tunnel made further locos available. These provided more than sufficient motive power for all the nuclear material trains, allowing DRS to bid for (and win some)) general freight work. This has caused some ill feeling with competitors, since BNFL is a nationalised industry.

C3 National Power

The other company to use Open Access to move its own traffic was National Power (NP), a company set up when the Electricity Generating Industry was privatised, owning about half of the coal-fired power stations. NP began with just one loco and trainset, to supply limestone in connection with Flue Gas Desulphurisation at Drax power station, the biggest in GB. It then progressed to buy five more locos, and sufficient wagons, to operate a 45 minute interval service supplying Drax with coal from local coalfields. The locos were new-build, to a U.S. design used by Mendip Rail (though operated by BR). Although the operation was generally agreed to be satisfactory, and there was a considerable saving relative to BR charges, it became obvious that EWS was prepared to drop their price to a competitive level. National Power then sold out its operation to EWS in 1998.

D Infrastructure

Historical data on rail movements of infrastructure materials, principally track components and ballast, are not available, being a purely internal matter for the railway. However, following privatisation, the freight train operating companies are no longer carrying this infrastructure traffic on their own account, but on behalf of Railtrack (or its successor). Originally it had been intended to leave Railtrack in the public sector, and for it to operate its own infrastructure services. Once it was decided to privatise Railtrack it seemed sensible to pass the traffic to the three Trainload Freight companies, together with the assets used. There were some understandings regarding future traffics, but Railtrack were subsequently to be free to give traffic to other freight train operating companies, or to operate on own account.

As we have seen, EWS took over all three Trainload Freight companies in early 1996. It therefore took over the infrastructure traffic. There was a fraught relationship between EWS and Railtrack, as both were a major customer of the other! EWS bought train paths from Railtrack and Railtrack bought infrastructure train services (locos, wagons, crews) from EWS. Possibly fearing a move by Railtrack to diversify its infrastructure train suppliers, EWS began a bold plan of updating the engineer's wagon stock used (referred to by BR as Departmental) and promised to use its best locos on infrastructure work (contrary to the BR practice of using its best locos on revenue earning traffic). Despite that, EWS were subsequently hard hit when Railtrack diversified its train suppliers and invested in its own wagons, leaving some of EWS's newly purchased wagons to stand idle.

Yet more damaging to EWS was that Railtrack's long term contracts with the new entrants to the infrastructure market enabled these companies to purchase locos identical to those EWS had bought. These locos, being sufficient for Railtrack's peak requirement within each contract, had sufficient spare availability to allow these companies to bid against EWS for general freight work, thereby enabling real competition in the market place and overcoming the main barriers to entry.

Initially, Freightliner received a contract for infrastructure work, thereby diversifying from container train operation. Twenty locos were dedicated to this work, but additional locos were ordered, allowing further diversification and updating of

Freightliner's loco fleet. Further orders were placed, with the additional locos totalling 57 at the time of writing. Consequently Freightliner will have at least 77 large freight locos, as against the 400 or so operated by EWS.

More recently, a passenger train operating company, GB Railways, successfully bid for a Railtrack contract. This funded seven dedicated locos, which nevertheless found time for other work allowing the winning of a container train contract that is funding a further five locos. The effect on EWS of these two companies entering the freight market on the back of infrastructure work, is that it is having to mothball many of its own large freight locos. EWS has been extremely reluctant to sell them off due to fears that they would facilitate further competition. Nevertheless, in 2001 it did (following the intervention of the Rail Regulator) sell off many smaller locos and several of these are returning to operational status in some guise or other. Latest indications are that GB Railways' contracts are now sufficiently attractive that its freight arm, GB Railfreight, may be bid for by Freightliner. Clearly, it is still too early to say whether a stable market will result, but indications are that the privatisation has been successful in this area.

In summary, then, despite having been placed on the market as six separate companies, the privatisation process was completed with these companies being amalgamated into just two, with a dominant general freight train operator (with some 85% of the rail freight market) and a specialist container operator. In the years since privatisation these two operators have increasingly been competing, particularly in the infrastructure and bulk markets, and three new open access operators have entered the market, of which two are still operating. There is little doubt that this limited amount of competition has had a substantial impact; the fact that customers can go to alternative operators when contracts come up for renewal clearly puts pressure on existing operators. Yet the extent of competition in practice has been rather limited. The next section explores the reasons why more competition, particularly from new open access operators, has not taken place.

3. Barriers to competition

At the time of rail privatisation, the government was very keen to encourage new entry into the rail freight business as one way of improving efficiency and competitiveness of rail freight by increasing competition. Other commentators (Nash and Preston, 1992; Brewer, 1996) foresaw considerable barriers that a new operator would have to overcome. Principal amongst these were:

- Difficulty and cost of recruiting staff with appropriate experience and of training new staff, including providing train crew with the necessary experience and route knowledge;
- acquisition of locomotives and rolling stock, given the existence of a very limited second hand and short term leasing market;
- economies of scale, particularly in terms of the ability to maintain high levels of asset utilisation whilst maintaining sufficient spare vehicles to maintain reliability, meaning that a new entrant would incur a cost penalty unless they entered on a substantial scale;
- the difficulty and price of obtaining appropriate paths on the infrastructure.

Subsequently, Whiteing and Brewer (1998) report the results of interviews with actual new entrants (namely National Power and Direct Rail Services). To some extent all of the above barriers were found to exist in practice. Operators had some success in recruiting staff with appropriate experience from British Rail, but had also had to undergo costly training exercises themselves, and Direct Rail Services in particular found it costly to maintain a wide route knowledge (the latter is obviously less of a problem with a specialist operation operating a very limited set of routes than with a more general operator). Whilst Direct Rail Services had made use of second hand locomotives, National Power found it necessary to buy new. Both suffered somewhat from small scale in terms of costs, but found entry worthwhile as they felt they faced a monopoly operator who was charging an excessive mark-up over costs. The cost and availability of paths was a concern to both.

These problems suggest that if the European Commission and member states wish to promote entry into the rail freight market, they need to think about ways of improving the functioning of labour and asset markets in the rail industry. An extreme solution might be to give new entrants rights to use train crew and rolling stock of existing operators at a regulated price.

An additional cost which proved much more significant than had initially been anticipated was the cost of preparing and getting a 'safety case' accepted, a necessary condition for obtaining an operators' licence. It was necessary to employ consultants to do this and it is believed that the costs typically amount to several million pounds as well as much senior management time. Clearly this is a substantial start-up cost for a small operator.

But as anticipated, it was the price and availability of paths on the infrastructure that proved one of the most contentious issues. The original approach to rail access charges in Great Britain was determined by the government prior to privatisation and set out in Department of Transport (1993). What this paper proposed was that freight and open access passenger operators should pay a negotiated charge, at least covering their avoidable costs and making as large a contribution as possible to fixed and common costs. Franchised passenger operators should pay a variable charge equal to the cost implications of running additional trains, and a fixed charge equal to their other avoidable costs plus a share of fixed costs not covered by freight and open access operators or other sources of revenue.

The aim of this structure was to reconcile the fact that the majority of infrastructure costs were found to be common between operators, and – at least in the short to medium term – fixed with a belief that efficiency of the infrastructure provider would be promoted if all its costs had to be covered from revenue from train operators. However, this could not be done simply by raising charges above marginal cost without major distortions to the efficiency of use of the infrastructure (para 3.3)
"If Railtrack were to charge all operators a proportion of common and fixed costs through a standard tariff, it would drive off the railways traffic which was in a position to pay for its avoidable costs..."

The recommended solution was therefore that:
"The long term health of the railway industry will be best secured if Railtrack pursues a policy of market pricing, subject to the avoidance of unfair discrimination between

competing operators in the same market. All operators should therefore pay the avoidable costs which can be attributed directly to them, and should contribute to common costs differentially, reflecting their ability to pay".

It became the duty of the Rail Regulator to review all aspects of access agreements, including infrastructure charges, and he put forward his policy in Office of the Rail Regulator (1995). Broadly he considered that the proposed approach to negotiation of charges, backed up by his powers to investigate and prevent alleged discriminatory charges between operators, was the best approach to the development of rail freight. Evidence that he was prepared to use these powers is provided by the fact that in at least one of the cases of new entrants, he is known to have intervened and obliged Railtrack to lower its charges.

However, the major freight operator, EWS, soon found that the necessity to negotiate separate access charges for each flow of traffic was time consuming and led to uncertainty in the negotiation of new contracts. It therefore negotiated with Railtrack a two-part tariff, somewhat similar to those of the passenger franchisees, under which it paid a large fixed sum plus a lower fixed charge per gross tonne kilometre of freight traffic. The Regulator consulted widely as part of his review of this agreement, and found, not surprisingly, that other operators feared that this would put them at a disadvantage, as for new traffic EWS would be able to price down to the variable part of the charge, whereas Railtrack would expect to charge another operator something above the variable charge. Moreover, customers were concerned that, for this reason, they would become more captive to EWS.

In the event, the Regulator accepted that the advantages to the development of rail freight as a whole of the new structure justified its introduction, and considered that his powers to look at all Railtrack's charges and to prevent discriminatory behaviour on the part of Railtrack, were sufficient to prevent this problem (Office of the Rail Regulator, 1997a).

The first periodic review of track access charges started with the publication of a consultation document in December 1997 (Office of the Rail Regulator, 1997b). The Regulator considered that charges should:
- incentivise Railtrack, train operators and funders to maximise the efficient use and development of the network;
- avoid undue discrimination between operators;
- appropriately reward Railtrack for changes in the level of output;
- meet the government's overall transport objectives.

Problems with the existing structure of charges were:

- negotiations for freight operators (other than EWS) and open access operators were complex and time consuming, whilst negotiations on variation of access rights for franchisees were simply not working;
- the charging structure for franchisees gave no incentive for economy in the use of scarce capacity and no adequate mechanism for the replacement of existing low value services by higher value ones. Operators were not adequately charged even for wear and tear, and not charged at all for congestion and opportunity cost of slots;

- moreover circumstances had changed significantly since the charges were originally set. There had been a rapid growth in both rail traffic and train kilometres, leading to much greater congestion and requirements for investment in new capacity than had been anticipated, and it was the policy of the new government that this should continue. However incentives to expand the network were poor;
- the ability of Railtrack to negotiate charges according to the ability of a TOC to pay, led to extreme secrecy about demand on the part of TOCs to the detriment of service and investment planning.

During the review, Railtrack provided evidence of substantially higher wear and tear costs than allowed for in the existing charges, and also quantified congestion costs in fine detail by track section and time period (Gibson,2000). It should be noted that the direct delays caused by an additional train, for instance due to locomotive failure, were already charged for through the performance regime (under which operators compensated Railtrack for delays they caused, and vice versa); what was being costed here was the additional delays to subsequent trains simply due to the train in question taking up capacity and thus reducing the ability of the system to recover from delays caused by other factors. Congestion charges in the event fell predominantly on passenger operators, since freight tends to operate away from the passenger peaks in demand.

Consideration was given to improving the incentive of Railtrack to expand the network by also incorporating the capital costs of expansion into the variable element of the access charge on the basis of a calculation of long run marginal cost; however, it was found that this varied enormously with the location, size and nature of the additional capacity required, and no feasible way of including this in the tariff was found. Instead attention concentrated on quantifying the congestion cost of adding additional trains to the network. Arguably this was sensible, given the long time periods and indivisibilities involved in many plans to upgrade capacity.

The recommendations of the Regulator at the end of the process were (Office of the Rail Regulator, 2000; 2001):

- an increase in the variable part of the track charges to reflect the full wear and tear cost and 50% of the quantified congestion cost. It appears that the Regulator was concerned that including the full congestion charge would give train operators too much incentive to cut services;
- a move to a published tariff for all operators, with franchised operators continuing to pay on a two part tariff, but freight and open access operators paying only the variable element of the tariff;
- an incentive payment to Railtrack based on increases in traffic in order to encourage expansion of the network. This was paid for direct by the Strategic Rail Authority, and hence did not add to the costs of the train operators

The Strategic Rail Authority agreed to bear the infrastructure costs of freight operation over and above the variable element of the charge, thus halving the charges paid by existing operators and removing any competitive problems posed by the previous two-part tariff of EWS.

Table 2 gives some idea of the proposed level of charges for bulk and other freight, and how they relate to operating costs and revenues as in 1998. The table also shows estimates of external costs, namely air pollution, noise and global warming. Although these are much smaller for rail than road, it is clear that they are typically significant relative to the marginal infrastructure usage costs and should therefore be included.

Table 2 Infrastructure, operating and external costs for Rail freight 1998

Category	Costs						Revenue	Diff-erence Cost - Revenue
	Marginal infrastructure usage	Vehicle operating cost	Air pollution	Noise	Climate change	Total		
Bulk	1.79	8.60	0.166	0.170	0.131	10.86	13.01	-2.15
Other	0.88	9.70	0.166	0.170	0.131	11.05	13.61	-2.56
Freight Sector	1.19	9.28	0.166	0.170	0.131	10.94	13.41	-2.47

Note: low cost estimates apply to environmental categories only.

Source Sansom et al, 2001

The price of track access was only part of the issue however. The other part of the issue was the availability of paths and their quality. This has been an issue in specific cases, such as the West Coast Main Line upgrading, and also more generally. The problem is that, whereas passenger services are run under reasonably long term franchises and passenger operators can foresee reasonably accurately their track access requirements many years ahead, the same is not true of freight. Freight access requirements change with little notice, and freight operators are frequently in the position of effectively having to seek to obtain paths on the 'spot' market. Inevitably this tends to mean that passenger services get priority in the allocation of slots. The fear was that, in the West Coast Main Line case, there would be so little capacity left for freight that the potential growth of rail freight would be impossible. Whether this makes sense in terms of the relative value of the two types of service is questionable.

The issue came to head when EWS sought to negotiate renewal of its track access agreement. It applied for a contract guaranteeing it certain amounts of capacity, and running for ten years, with the possibility of extension at EWS's request for up to fifteen years. Railtrack argued that such an agreement would become illegal under Directive 2001/14 (which imposed a normal five year maximum on such agreements except in the case of major investment), and also that it could not possibly guarantee capacity over such a long period. In the event the two sides compromised on, and the Regulator sanctioned, an agreement for five years, with the possibility of extension for a further five (Office of the Rail Regulator, 2002).

Clearly if EWS succeeded in tying up all the paths available for freight over key main lines, this would be a major constraint on competition. The government had tried to guard against this at the time of privatisation by enabling customers to negotiate direct with Railtrack over paths and to secure the rights to the paths they needed regardless of which operator they used. However, customers generally preferred to leave this to the operator, and the regulator felt obliged to strengthen the ability of customers to change operator by including 'use it or lose it' clauses in access agreements and – because these would generally only come into effect after a path had not been used for

some months – also providing that if a customer switched operator the existing operator would be expected to transfer the path to the new operator.

In terms of quality, freight does appear to have achieved better access to paths than under the old regime, in which passenger services received clear priority. For this reason the Rail Freight Group (a pressure group for the industry) has been strongly opposed to any suggestion of integration of rail track with the passenger operators, which would be likely to worsen their position. But the relationship between freight operators and Railtrack has not been entirely happy. Some operators reported finding Railtrack arrogant and unhelpful (Mercer, 2002), and the American owners of EWS found the situation in which they did not control their own infrastructure strange and alarming:

" The whole Railtrack thing bothers me, as it's a major cost element which under the worst conditions could be out of control. It could have the ability to destroy the competitiveness of any rail operating company."

(Burkhardt, quoted in Rail magazine, Jan 1996, p28)

The succession of events since then, in which the Hatfield accident led to severe speed restrictions across the network and the resulting increases in costs and compensation payments led to the bankruptcy of Railtrack, are too complex to analyse in detail here. Suffice it to say that these events do not necessarily indicate the inappropriateness of the separation of infrastructure from operations, and indeed in a passenger dominated European network such separation is still likely to work to the interests of freight operators. What went wrong at Railtrack was very much more the consequence of how Railtrack managed its business, and of problems in the relationship between Railtrack and its engineering contractors, than evidence that such separation cannot be made to work. What is clear, however, is that the separation of infrastructure from operations in Sweden, where the infrastructure organisation is a public body following cost-benefit criteria in its decisions, has been very much less problematic than that in Britain with a fully privately owned and commercially oriented infrastructure company.

4. Inter modal competition and the freight grant regime.

A further obvious reason for the limited number of new entrants into the rail freight business is the relatively poor profitability of rail freight in Great Britain. As we saw in Table 1, in 1992, before privatisation, the freight operations of British Rail were in total heavily in deficit, although trainload freight was operating at a profit. Following privatisation, Table 3 shows a better situation, with all three freight operating companies moving into profit. But apart from some dense flows of bulk commodities, Great Britain is not a particularly attractive place to operate rail freight services, being characterised by rather short lengths of haul, a lack of international traffic (the failure of the Channel Tunnel so far to alter this was discussed above) and an intensely competitive road haulage business which was fully deregulated as long ago as 1968.

Table 3: Profitability of the Privatised Rail Freight Industry in Great Britain (£m)

		EWS	Direct Rail Services	MCB Ltd*	TOTAL
Turnover	97	618.1	0.4	96.6	715.1
	98	540.6	2.1	124.6	667.3
	99	533.7	5.3	128.6	667.6
Operating Costs	97	539.7	0.8	94.4	634.9
	98	472.5	2.0	117.3	591.8
	99	483.9	5.0	122.6	611.5
Operating Profit	97	78.4	-0.3	2.2	80.9
	98	68.1	0.1	7.3	75.5
	99	49.8	0.3	6.1	56.2
Other Expenses	97	17.9	0	3.7	21.6
	98	11.3	0	4.3	15.6
	99	13.2	0.1	5.0	18.3
Pre-tax Profit	97	60.5	-0.3	-1.6	58.6
	98	56.8	0.1	3.0	59.9
	99	36.6	0.3	1.0	37.9
Profit	97	-1.8	-0.2	-3.6	-5.6
	98	48.4	0.1	2.1	51.5
	99	32.8	0.2	0.2	33.2

*Parent company of Freightliner
Source: TAS Rail Monitor, 2000.

Prior to privatisation, for many years British Rail had been ordered to run its freight businesses on a purely commercial basis, without subsidy. This had been interpreted to mean that freight should at least cover its avoidable cost; it was not expected to contribute to the joint costs of the rail system. To the extent that there were however joint costs between different flows of freight traffic, individual flows would have to be priced sufficiently above marginal cost that collectively they covered that joint cost.

To the extent that the rail operator is able to practice price discrimination and capture the benefits to users of additional traffic, the need to earn a surplus above marginal cost may not be a problem in terms of economic efficiency. Indeed if perfect discrimination may be applied then it is only worth maintaining services that can cover total costs in this way. (Joy, 1971). This is more likely to apply for freight traffic, provided that there is no regulation preventing negotiation to obtain the best price for each traffic flow, than for passenger, where naturally such negotiations are impossible. However, as noted above, the introduction of competition within the rail freight market made such price discrimination more difficult, since the customer charged above marginal cost by one operator could go to another.

Moreover, the result that with perfect discrimination, only services that can cover their avoidable costs from revenue are worth retention depends on the competing modes, in most cases in Britain road transport, being appropriately priced. Given that at present road haulage is charged for the use of the roads solely through two taxes, an

annual lump sum vehicle excise duty and fuel tax, it is not possible for road haulage to be appropriately priced everywhere. The fixed lump sum bears more heavily on vehicles engaged in short distance work than long, whilst fuel tax does not vary adequately with the weight and axle weight of the vehicle or with the nature of the roads on which it runs in terms of the degree of congestion and the sensitivity of the location to pollution and noise.

But a number of studies have suggested that road haulage does not even bear on average the costs that it causes, in terms of wear and tear, environmental and congestion costs. For instance, compare the figures for road haulage in Table 4 with those for rail in Table 2 above. Whilst rail is paying slightly more than marginal cost, on average road haulage is paying substantially less. These figures apply to 1998; since then taxes on road haulage vehicles have been substantially reduced as a reaction to the fuel price protests of the year 2000.

Table 4: Marginal Cost and Revenue Analysis by Type of Vehicle and Time of Day, 1998

Categories	Costs										Revenues					Difference
	Infrastructure operating cost & depreciation	Vehicle operating cost (PSV)	Cong-estion	Mohring effect (PSV)	External accident costs	Air pollution	Noise	Climate change	VAT not paid (PSV)	Total	Fares (PSV)	Vehicle excise duty (part)	Fuel duty	Value added tax on fuel duty	Total	Costs - Revenues
Car, peak	0.05	-	13.22	-	0.78	0.18	0.01	0.12	-	14.4	-	-	3.86	0.68	4.5	9.8
Car, off-peak	0.05	-	7.01	-	0.80	0.18	0.01	0.12	-	8.2	-	-	3.86	0.68	4.5	3.6
LDV, peak	0.06	-	13.99	-	0.52	0.76	0.02	0.19	-	15.5	-	-	3.86	0.68	4.5	11.0
LDV, off-peak	0.06	-	7.07	-	0.53	0.68	0.02	0.18	-	8.5	-	-	3.86	0.68	4.5	4.0
HGV-Rigid, peak	3.82	-	26.00	-	1.40	1.84	0.06	0.44	-	33.6	-	2.25	13.11	2.29	17.6	15.9
HGV-Rigid, off-peak	3.77	-	12.75	-	1.39	1.57	0.06	0.43	-	20.0	-	2.25	13.11	2.29	17.6	2.3
HGV-Artic, peak	7.57	-	33.45	-	0.99	1.42	0.07	0.72	-	44.2	-	2.50	14.47	2.53	19.5	24.7
HGV-Artic, off-peak	7.55	-	19.81	-	0.99	1.41	0.08	0.71	-	30.5	-	2.50	14.47	2.53	19.5	11.0
PSV, peak	5.74	78.73	20.31	-14.43	3.82	3.17	0.09	0.58	13.33	111.3	76.19	0.61	5.26	0.92	83.0	28.4
PSV, off-peak	4.93	80.10	12.31	-14.86	3.69	3.15	0.09	0.55	13.49	103.5	77.10	0.61	5.26	0.92	83.9	19.6

Source: Sansom et al (2001)

The government has long given capital grants towards facilities for freight to move by rail (or water) in situations where road haulage is not paying enough to cover its environmental costs. At privatisation these grants were supplemented by a grant towards the costs of track access charges, given initially to specific operators arguably to make them profitable and therefore saleable. In particular the major recipients of the initial grants were the operators of container and other inter modal services, where it was believed that the full track access charges would make them unprofitable. These grants were originally administered by the Department of Transport and its successor government ministries, but when a new Strategic Rail Authority was set up in 2000 to implement government policy across both freight and passenger services, responsibility for rail freight grants was handed to the SRA. As noted above, the SRA has since moved towards providing such support for particular flows of freight on a 'company neutral' basis (SRA, 2002).

Table 5 shows that the total amount of money allocated as rail freight grants has risen substantially since privatisation. Whilst this may have started simply as a way of offsetting the loss of cross subsidy, as explained above, it has increasingly become necessary to counter the under charging of the road competitor. Although the government is now moving towards introduction of a kilometre based charge for heavy goods vehicles, based on a gps system which would ultimately be capable of differentiating in time and space, it has so far pledged that the changes will be revenue neutral, so the under charging of road freight is set to continue.

Table 5

Rail freight grants (£M)

1985-6	7
1986-7	6
1987-8	2
1988-9	2
1989-90	1
1990-1	4
1991-2	1
1992-3	2
1993-4	4
1994-5	3
1995-6	4
1996-7	15
1997-8	29
1998-9	29
1999-2000	23
2000-1	36

Source SRA National Rail Trends 2001-2002 no 3 2002

5 Prospects for rail freight in Great Britain

The figures in the appendix show that there has been a remarkable growth of rail freight since privatisation. The total volume in terms of tonne kilometres has returned to that seen in the 1970s. Moreover, rail has gained market share substantially overall and for all commodities except petroleum and chemicals. The reasons for this differential performance have been explained above. How long can this impressive growth continue?

The current target which the government has set the SRA is an 80% growth in rail freight tonne-km between 2000 and 2010. Historically, total freight tonne-km has risen slightly more slowly than GDP. The accepted view is that GB GDP has a trend growth of about 2.5% p.a., or 28% over ten years. Therefore if rail can maintain its share of freight tonne-km, market growth should account for some 25% out of the 80% target growth for rail freight, leaving 55% to be achieved by transfer from other modes (principally road). Our exposition here will assume just two modes, road and rail.

Transport economists model freight mode choice in terms of generalised cost, i.e. for each mode we consider the sum of monetary cost and the monetised values of all other attributes of the movement that differ by mode. The main attributes that have been considered are journey time and reliability. For these, rates of conversion to money have been determined. All other attributes are handled by adding into the generalised cost of one of the modes a 'penalty' representing the net monetary effect of all attributes not individually valued.

How are the desired monetary valuations derived? The value of a travel time saving for a lorry has, in Great Britain, been taken to be the saving in the driver's time, plus any savings in vehicle operating cost. No such simple direct approach is available, however, to value reliability, or the modal penalty referred to above. Neither is it easy to find data on sufficient actual cases of mode choice to determine the 'revealed preference' weightings placed on each attribute. Instead, recourse has been made to Stated Preference (SP) methods, where freight mode choice decision makers are faced with a number of hypothetical sets of alternatives and asked to choose between, rank or rate them. Often the alternatives will represent a choice of modes, and this will be required in order to estimate the modal penalty. By choosing the attribute levels carefully, it can be possible to deduce monetary valuations from the responses, and also spot respondents who are outliers who may have misunderstood the task, or sought to bias the results in some way.

The method just discussed works with groups of respondents all assumed to have the same attribute monetary valuations. In practice, big differences will result for the different commodities involved. Even for a particular commodity, the values of journey time (reduction) and reliability (improvement) will vary with whether the consignment is going to long-term store, is part of a Just-in-Time supply chain, or is going to a retail outlet. Consequently the method known as Leeds Adaptive Stated Preference (LASP) was developed at ITS Leeds (Fowkes and Tweddle, 1988). The inclusion of the word 'adaptive' indicates that the SP design is not fixed prior to the experiment, but continually adjusts in reaction to previous responses. Alternatives that are rated lowly may become cheaper, or quicker, or more reliable. This permits

the experimental design to present sets of alternatives that force changes in rank order, providing the raw material for attribute monetary valuations, regardless of the characteristics of the consignment. Responses are generally sufficiently rich that models can be estimated for individual respondents, thereby avoiding the pitfalls associated with pooling respondents during the model estimation. Once the individual valuations are available, however, it is sensible to group similar responses and average.

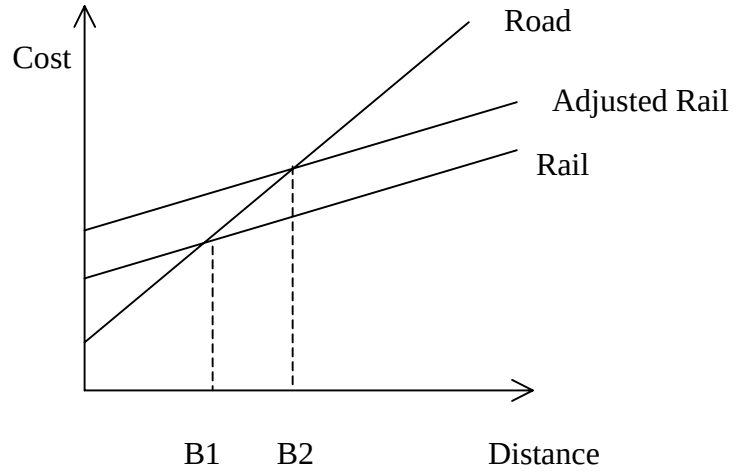

Fig 1 Competitiveness of rail and road

The use to which the derived monetary valuations can be put can be illustrated by Fig 1, which shows simplified cost functions for road and rail plotted against distance. Such diagrams could be drawn for individual commodities. Road has a relatively small fixed cost element with respect to distance but has costs rising steeply with distance. Rail has much higher fixed costs, particularly road collection and/or delivery is needed, but with cost rising less steeply with distance. Other things being equal, therefore, road is suited to shorter transits and rail to longer. Distance B1 is marked on the figure to indicate where the cost of rail is equal to the cost of road. However, we should not expect the two modes to share the traffic equally at distance B1, since there is service quality to consider: how long does the transit take?, how reliable is it? etc. Since we have unit values for a one hour's extra transit time, 1% more arrivals 'on-time', and the modal penalty, we can adjust the cost functions for these effects. For simplicity, we have left the road costs as before, but constructed an 'Adjusted' rail cost function incorporating the monetary value of the difference between road and rail. We have drawn the 'adjusted rail' line higher than the original rail line as it is currently generally the case in Great Britain that service quality is considered by mode choice decision makers to be worse for rail than road. The effect can be seen to push up the Breakeven distance from B1 to B2. At B2 we would expect half the traffic to use each mode.

Figure 1 can be used to illustrate the likely efficiency of one of the means that the SRA is using to encourage mode switching to rail. The Freight facilities Grant provides for a subsidy to be paid if rail is used in cases where road is cheaper but there are sufficient identified environmental benefits. The grant would reduce the 'rail' and 'adjusted rail' line, thereby reducing the breakeven distance. However, the grant would only be payable if we start off to the left of B1, otherwise rail would be

cheaper to begin with and the grant would not be payable. Since we can imagine that the battleground for mode share is located close to B2, this means that the grants are likely to be poorly directed. Similarly, the Track Access Grant has the effect of tilting the 'rail' and 'adjusted rail' lines downwards (i.e. becoming less steep but with the same intercepts), again reducing the breakeven distance, but again is only payable when road is cheaper than rail.

At the beginning of the year 2000, it was supposed that the U.K. government would continue with policies that would increase the cost of road freight relatively to rail. In particular, the fuel duty escalator was expected to continue to add to the monetary cost of rail (tilting the Road line upwards in Fig 1), as would new direct road use charges. Road congestion was expected to continue getting worse, hitting road journey times and reliability, and so bringing the 'adjusted rail' line closer to the 'rail' line. The effect of both of these would have been to reduce B2 in Fig 1. This would mean that, for each commodity group, the proportion of traffic for which rail was competitive would increase, with consequent predicted increases in rail traffic. However, during September 2000 there were widespread fuel price protests in Great Britain, which led to changes in government policy. In particular the fuel duty escalator was ended, vehicle excise duties were greatly reduced, 44 tonne lorries permitted to operate unrestrictedly, and the road building programme enhanced.

Consequently, if B2 is to fall significantly, it will be necessary to lower the Rail line in Fig 1, i.e. directly reduce rail costs, particularly in the competitive distance bands. Funds have been obtained by SRA from government to enable this. In addition to the grants and reduced track access charges mentioned above, SRA plans to be proactive in ensuring that adequate infrastructure is in place to handle the extra traffic, including financing schemes where necessary. Studies undertaken for the SRA have shown that the proposed subsidies should be sufficient to achieve the 80% growth target for tonne-km in 2010 compared to 2000 (SRA, 2002).

6. Lessons for Europe

Britain was one of the first countries to implement, and indeed go beyond, current European Union policy for rail freight. The European Commission is keen to open up rail freight markets to new entrants, and sees separation of infrastructure from operations, with fair and non discriminatory charges for the use of infrastructure and allocation of paths. Britain not only completely separated infrastructure from operations and introduced complete open access, with an independent Regulator to over see infrastructure charges and the allocation of paths. It also privatised both the infrastructure company and the freight operating companies. The experience described above may have some lessons therefore for other countries, and indeed for the Commission, as similar policies proceed elsewhere.

The first lesson which seems to emerge is that it can be quite difficult to introduce competition into the rail freight market. In the past, the failure of Directives such as 91/440 (which opened access to new entrants throughout the Union for international inter-modal freight traffic) to achieve much new entry has been ascribed to deliberate obstruction by the existing railways and in some cases their governments. That such obstructions existed is clear, but the British experience suggests that there are other crucial barriers to entry. Chief of these is the marginal profitability or unprofitability

of much rail freight traffic, although the short lengths of haul in Britain may make this situation worse than in much of Europe. The result in Britain was not just that very little new entry was attracted, but also that it was difficult to privatise the existing rail freight operations, and particularly to do so in a form that created several competing companies. With the help of the subsidies listed above, the privatised and open access companies appear to have succeeded in operating marginally profitably, but it is clear that rail freight in Britain has not excited a lot of interest amongst potential investors. A second barrier is the importance of sunk costs and economies of scale, which means that competition is likely to come from existing operators in other sectors, or from large customers seeking to put pressure on the existing operators than from totally new entrants. The effect of these is that attempts artificially to create competition by restructuring companies at privatisation will fail in the absence of a strong antitrust policy to prevent reconcentration.

A second lesson is that, without subsidies, privatisation and/or open access are likely to lead to the abandonment of some loss making traffics. The reason for this is that privatisation and/or open access will eliminate cross subsidies whereby profitable traffic supports unprofitable. Private operators have little incentive to cross subsidise, and cannot do so if new entry or the threat of entry eliminates the monopoly profits. The situation which pertained in Britain before privatisation, with profits on bulk traffic supporting loss making wagonload and inter-modal services, is likely to exist elsewhere in Europe.

A third lesson is that track access and charges are crucial. There is a problem if it is desired to raise from freight operators more than purely their marginal costs of use of the infrastructure. The most efficient solution to this is likely to be the introduction of two part tariffs, that enable the operator to attract additional traffic at marginal cost whilst raising the necessary surplus by price discrimination across the total traffic it carries. But it is difficult to do this in a way which does not hamper competitors. The solution adopted in Britain now is only to require freight operators to pay marginal cost. In typical European conditions, where passenger services dominate in determining the need for infrastructure, this seems a reasonable solution, but it does require someone else to pay both any joint costs of the freight business as a whole and all joint costs between freight and passenger.

But the infrastructure issue is not merely one of prices. It is also necessary to ensure that freight gets appropriate access to the infrastructure in competition with passenger services, and that the paths it has available are not monopolised by means of ‘grandfather rights’ of existing operators. In Britain, the means of seeking to achieve this has been the complete separation of infrastructure from all operators, and the creation of a strong independent regulator. Even so it has remained a problem area, because the needs of freight traffic are less predictable than passenger, and there is a risk that most capacity gets tied up in long term contracts with the passenger sector leaving little available for freight. Moreover, the problems that have surrounded Railtrack are well known and have hampered the development of rail freight in the last couple of years. Nevertheless it appears that – on passenger dominated railways - the separation of infrastructure from operations can be made to work, as in Sweden, and is likely to benefit freight operators who will otherwise always be subservient to passenger.

There are then a number of problems surrounding both the privatisation and the liberalisation of rail freight services. But despite these problems overall in the case of rail freight the experience of Britain must be judged a success. The increase in rail mode share seen in the appendix is truly remarkable after many years of decline. Individual success stories include the development of Freightliner from its very weak state at privatisation and the re-entry of rail into wagonload services with development of the 'Enterprise' network. The new operators have invested heavily, bringing substantial private capital into the rail freight business and appear to have improved quality of service. In this process both privatisation, which has freed the operation from dependence on government for its strategy and investment, and competition, which has put pressure on the rates and quality of service offered by the incumbent operator, have played a part. It appears competition has been important even though in practice the amount of competition actually within the rail freight sector has been very limited. It is well recognised that the realistic threat of competition can have a major impact, even when competition is actually quite limited in practice. Despite the problems that have surrounded Railtrack, and some of the passenger operators, and despite the continued uncertainty about the future of the major operator, EWS, privatisation of rail freight in Britain is a clear success story, and one which should encourage other countries to consider more radical change.

However, the success in Britain has not been achieved by the government simply withdrawing from rail freight and leaving it up to the market, or even by simply relying on a strong independent regulator to ensure that freight operators were treated fairly by Railtrack in terms of price and when competing with passenger operators for paths. From an early stage, the government showed itself as willing to use subsidies to pave the way to privatisation, and their volume has increased as government aspirations for rail freight grew, as rail infrastructure costs increased and as taxes on its chief competitor – road haulage – were reduced. Such subsidies do appear to have strong justification in the continued failure to charge road haulage its full social costs. Whilst more competition may help to get costs down, a major revival of rail freight is likely – as in Britain – to need either higher charges on heavy goods vehicles (Britain had amongst the highest charges in Europe before the year 2000 cuts) or subsidies to rail.

Appendix

Trends in Road and Rail Freight in G.B.

The Tables of Traffic

Tables A1 to A4 present some data on road and rail freight in Great Britain since 1975, and with particular detail since 1995. The tables measure goods moved, i.e. net tonne-km. Tables A1 to A3 are in billions, and A4 in percentages. A rough breakdown of the figures into commodity groups has been attempted, but official data is patchy for rail and some licence has been exercised.

Data was generally only available in already rounded form, and so the percentages in Table A4 will wobble a little purely due to rounding effects. Since the mid 1980s the rail figures relate to financial rather the calendar year, but no adjustment has been made for that. The totals over all commodities agree with official figures except for 1996 and 1997, before and after which there were breaks in the official rail series. The figures presented here are as comparable and consistent as we have been able to make them, and reflect reality as we perceive it. Nevertheless they merely reflect our best guess:- if a figure rises between two years it does not necessarily mean that traffic actually rose between those years!

The pre-privatisation data for 1975 to 1995 reflect the substantial fall in rail carryings, the rapid rise in road carryings, and the consequential fall in rail's mode share (of total road and rail traffic) from 19% in 1975 to 8.5% in 1995. Rail's mode share over ALL modes would obviously be lower still, being 6% in 1995. However, difficulties with the data for water-borne transport make its inclusion problematic and so it is not further considered in this paper (it is mostly coastal shipping associated with the oil industry).

Since 1995 rail traffic has risen by some 50% while road traffic has only risen by some 4%, thereby increasing rail's share to 11.6%. Unfortunately, at the time of privatisation, collection of statistics was at its worst. It is the very years we would wish to use as our base (1995, 1996 and 1997) that we have least faith in the data for. However the SRA official series accepts the 13.3 bn tonne-km we have for total rail traffic in 1995 (and the figures we show for the totals in 1998 to 2001) and so we propose to take 1995 as our pre-privatisation base year.

Looking at the individual commodities, Table A3 clearly shows the effect of the steel workers strike in 1980, and Table A1 shows the effects of the coal miners strike of 1984/5, which particularly affected rail carryings of coal. We considered avoiding these years as being atypical, but all years will be atypical to some extent, especially depending on the position in the economic cycle.

Looking at the road plus rail figures in Table A3, we see that the Food, Drink and Agriculture sector doubled its traffic between 1975 and 2001. Coal traffic has been erratic but, ignoring the 1985 strike affected figures, carryings in 2001 were historically low, though much higher than any year since privatisation. Petroleum related traffic was at much the same level in 2001 as in 1975. Given that not only the 1980 steel workers strike but also the 1985 coal miners strike had an effect on steel

production, the 2001 figures for metal sector traffic is historically low. Construction traffic is affected more than most by economic conditions which may explain its buoyant traffic levels in recent years. Chemical and Fertiliser traffic showed an increase up to 1990, with some signs of reduction recently. The 'other' category has more than doubled in size. This is predominantly road traffic and besides 'general merchandise' (whatever that is) the data will include any cases where the commodity of a lorry load was unknown, or where there was more than one commodity carried. Since a third of traffic now falls in this 'other' category, we would join with those recommending that some effort be made to find out what this 'other' traffic is. Overall traffic has risen at 1.7% p.a. over the 26 years, rather below the growth in GDP.

Turning to Table A1, we see that coal is always the largest grouping, and usually represents a third of total rail traffic. The coal grouping is not all coal, including some other traffic for the energy sector of the economy. The 1995 figure for just coal alone is thought to be 3b net tonne-km, as opposed to 3.6b shown in Table A1 for the grouping as a whole. The figures in Table A1 are the official figures. Petroleum, Metals and Construction were all important. These four groups were handled as separate subsectors by the Trainload Freight sector of BR prior to privatisation. The remaining groupings were run by the Railfreight Distribution sector. Most of the 'other' category was Freightliner Container traffic (for which the commodity is not recorded), so that in 1999 Freightliner had almost as much traffic as the coal group.

The increase in rail traffic after privatisation can be seen to be fairly widespread over commodities, except that Petroleum and Chemicals have lost traffic gradually. It is also noticeable that the 'other' category has shrunk in 2000. This is known to be partly due to a fall in Domestic Intermodal carryings, which is the name now (somewhat confusingly) given to what used to be Freightliner international maritime traffic. This fell from 3.9 bn tonne-km in 1999, to 3.8 in 2000, and to 3.5 in 2001, thought to be due to the downturn in world trade. The Infrastructure traffic shown from 1998 is mostly the movement of ballast and track for rail-laying, and the removal of spent ballast and replaced track. Data is not available for earlier years as this was a purely internal matter for BR. These figures are not included in the totals. The extent that road maintenance materials movements are included in the road figures is unclear.

Turning to Table A4 we see how rail has fared relative to road. The Food, Drink and Agriculture figures should be regarded as unreliable but, on face value, show a decline reversed after privatisation, which is probably correct. Coal traffic was lost to road during the 1985 coal miners strike, during which many railway workers refused to move what coal was available for movement. Rail was slow to re-establish its market share; and had not done so by the time of privatisation, though the data indicate that it now has. This has been helped by the increased distances over which coal is now moved, which favour rail over road. Petroleum movements have been lost from rail to road because of the size of rail facilities required for, say, a weekly trainload delivery making rail increasingly uneconomic for low quantity customers. New safety regulations have strengthened this trend and pipelines have undermined the economics of rail facilities at large refineries. Metals traffic saw rail lose market share prior to privatisation, but more than regain it since. Rail had a healthy share of construction traffic up to 1990, but has found the competition more difficult since.

Chemical and Fertilizer traffic has suffered from more stringent safety regulations. The ending of the Speedlink wagonload service in 1991 made many movements uneconomic, since trainload movements would have required more of the expensive specialised wagons, as well as greater storage facilities, which could be a threat to the local populace. Rail's share of the 'other' traffic dipped sharply after Freightliner closed much of its domestic network in 1989, but grew again immediately after Freightliner was privatised.

The growth in rail net tonne kilometres reported in Table A1 is rather greater than that forecast in NERA/MVA/STM/ITS (1997) in a report for the Rail Regulator. That report had forecast a base case of 12.3 billion net tonne km in 2005 if no changes were made to BR policy and there were no additional help from the government. With key industry improvements, this figure rose to 17.21b tonne-km (in 2005), a figure already comfortably exceeded (although of course falls between now and 2005 are possible). With greater access to grants for rail, and the use of taxes or charges to increase road costs, a figure of 20.52b tonne km was thought possible in 2005. Actual outturn therefore supports the view that the effect of privatisation has been to greatly increase traffic, achieving (or bettering) the top end of what was thought possible in 1997.

Table A1
Billion Net Tonne-km by Rail

YEAR	A	B	C	D	E	F	OTHER	TOTAL	INF
1975	0.7	7.3	2.5	3.0	3.1	1.1	3.2	20.9	
1980	0.5	6.5	2.3	1.7	2.8	0.9	3.1	17.6	
1985	0.6	4.1	2.0	2.0	2.8	0.7	3.1	15.3	
1990	0.5	5.0	2.1	2.2	3.5	0.6	2.1	16.0	
1995	0.5	3.6	1.8	2.1	2.5	0.5	2.3	13.3	
1996	0.5	3.8	1.7	2.4	2.2	0.6	2.4	13.6	
1997	0.7	4.4	1.8	2.6	2.4	0.5	2.5	14.9	
1998	1.1	4.5	1.8	2.7	2.8	0.5	3.9	17.3	0.8
1999	1.1	4.8	1.7	2.8	2.7	0.4	4.7	18.2	0.8
2000	1.1	4.8	1.6	2.7	3.2	0.4	4.3	18.1	0.9
2001	1.2	6.2	1.4	3.1	3.7	0.4	3.7	19.7	1.2

YEAR: for recent years, rail statistics refer to an April to March year
A: Food, Drink, Agriculture
B: Coal class traffic (principally but not wholly coal)
C: Oil and Petroleum
D: Metals
E: Construction etc.
F: Chemicals
OTHER: Mainly Freightliner Intermodal (between 75 and 90%) plus automotive and odds and ends
INF: Railway infrastructure No data prior to 1998. Not included in TOTAL.

Source: Transport Statistics Great Britain, Railtrack Network Management Statements, SRA National Rail Trends

Table A2 Road Billion Tonne-km

YEAR	A	B	C	D	E	F	OTHER	TOTAL
1975	23.8	2.3	4.5	8.4	19.2	6.8	23.9	89.0
1980	25.9	2.6	4.3	6.5	17.9	6.7	25.9	89.7
1985	29.1	4.2	4.3	7.3	18.7	7.9	27.5	99.1
1990	37.0	4.2	4.9	8.4	23.9	9.7	42.6	130.6
1995	42.6	2.7	5.7	9.3	24.2	8.9	50.2	143.7
1996	45.2	2.5	6.1	8.5	23.1	9.2	52.0	146.8
1997	46.4	2.7	5.8	9.6	24.7	9.5	50.9	149.6
1998	48.6	2.0	5.2	8.8	24.0	9.1	54.2	151.9
1999	47.9	2.2	5.0	8.1	23.3	8.8	53.9	149.2
2000	50.6	1.5	6.4	8.0	23.0	8.0	52.9	150.5
2001	47.6	2.1	5.8	6.9	24.7	8.4	53.9	149.4

YEAR: calendar years
A: Food, Drink, Agriculture
B: Coal
C: Oil and Petroleum
D: Metals
E: Construction etc.
F: Chemicals
OTHER: Manufactures, Miscellaneous and Mixed loads.
Source: Transport Statistics Great Britain

Table A3 Road plus Rail Billion Tonne-km

YEAR	A	B	C	D	E	F	OTHER	TOTAL
1975	24.5	9.6	7.0	11.4	22.3	7.9	27.1	109.9
1980	26.4	9.1	6.6	8.2	20.7	7.6	29.0	107.3
1985	29.7	8.3	6.3	9.3	21.5	8.6	30.6	114.4
1990	37.5	9.2	7.0	10.6	27.4	10.3	44.7	146.6
1995	43.1	6.3	7.5	11.4	26.7	9.4	52.5	157.0
1996	45.7	6.3	7.8	10.9	25.3	9.8	54.4	160.4
1997	47.1	7.1	7.6	12.2	27.1	10.0	53.4	164.5
1998	49.7	6.5	7.0	11.5	26.8	9.6	58.1	169.2
1999	49.0	7.0	6.7	10.9	26.0	9.2	58.6	167.4
2000	51.7	6.3	8.0	10.7	26.2	8.4	57.2	168.6
2001	48.8	8.3	7.2	10.0	28.4	8.8	57.6	169.1

Key and source: as for Tables A1 and A2

Table A4 Rail % of Road plus Rail total tonne-km

YEAR	A	B	C	D	E	F	OTHER	TOTAL
1975	2.9	76.0	35.7	26.3	13.9	13.9	11.8	19.0
1980	1.9	71.4	34.8	20.7	13.5	11.8	10.7	16.4
1985	2.0	49.4	31.7	21.5	13.0	8.1	10.1	13.4
1990	1.3	54.3	30.0	20.8	12.8	5.8	4.7	10.9
1995	1.2	57.1	24.0	18.4	9.4	5.3	4.4	8.5
1996	1.1	60.3	21.8	22.0	8.7	6.1	4.4	8.5
1997	1.5	62.0	23.7	21.3	8.9	5.0	4.7	9.1
1998	2.2	69.2	25.7	23.5	10.4	5.2	6.7	10.2
1999	2.2	68.6	25.4	25.7	10.4	4.3	8.0	10.9
2000	2.1	76.2	20.0	25.2	12.2	4.8	7.5	10.7
2001	2.5	74.7	19.4	31.0	10.9	4.5	6.4	11.6

Key and source: as for Tables A1 and A2

References

Abbott J (1994) Freightliner: who will buy it. Modern Railways, December, pp 749-752.

Bowker, R (2002) Britain's Railway – time for a new radicalism, Sir Robert Reid Lecture, Institute of Logistics and Transport, London.

BRB (1963) The Reshaping of British Railways. HMSO London.

Brewer P R (1996) Contestability in UK rail freight Markets: the economics of open access. Transport Policy, 3 (3) 91-98

Caves D W et al (1987) Network Effects and the Measurement of Returns to Scale and Density for US Railroads. In A F Daugherty (ed) Analytical Studies in Transport Economics, Cambridge University Press, Cambridge.

Department of Transport (1993) Gaining access to the Railway network. The Government's proposals, London.

Fowkes AS and Tweddle G (1988) A computer aided Stated Preference experiment for freight mode choice. Proceedings of ? D, PTRC, London, pp 295-305.

Freeman Allen G (1989) The Railfreight Market – Distribution. Modern Railways, May, pp 233-239.

Gibson, S (2000) Charging for the Use of Railway Capacity. in Chris Nash and Esko Niskanen, Eds. Helsinki Workshop on Infrastructure Charging on Railways. VATT Discussion Paper 945, Helsinki.

Harris M (1983) From Wagonload to Speedlink. Modern Railways, November, pp 569-573.

S Joy (1971) Pricing and Investment in Railway Freight Services. Journal of Transport Economics and Policy, vol 5.

Mercer Management Consulting (2002) The GB Rail Industry: in its own words. Problems and Solutions. Mercer, London.

Nash CA and Preston J M (1992) Barriers to entry in the railway industry. University of Leeds Institute for Transport Studies Working Paper no 354

NERA/MVA/STM/ITS (1997), The Potential for Rail Freight, report to Office of the Rail Regulator, London.

Office of the Rail Regulator (1995) Framework for the Approval of Railtrack's Track Access Charges for Freight services, A Policy Statement, London.

Office of the Rail Regulator (1997a) Charging, Competition and Rail Freight Development Issues Raised by the Proposed EWS Track Access Agreement. Provisional Conclusions, London.

Office of the Rail Regulator (1997b) The periodic review of Railtrack's access charges: a proposed framework and key issues, London.

Office of the Rail Regulator, (2000) Periodic review of Railtrack's access charges: final conclusions. London.

Office of the Rail Regulator (2001) Review of freight charging policy: provisional conclusions, London.

Office of the Rail Regulator (2002) EWS-Railtrack Rail Regulator's Conclusions on Application under section 17, Railways Act 1993, London.

Sansom T et al (2001) Surface Transport Costs and Charges. Great Britain 1998. Institute for Transport Studies, University of Leeds

Strategic Rail Authority (2002) The Strategic Plan, London.

A E Whiteing and P R Brewer (1998) Contestability in the UK Rail Freight Market: What are the key barriers to entry and how can they be overcome? Trasporti Europei, vol 9 no 10 12-22.