PASSENGER RAIL TODAY: A EUROPEAN PERSPECTIVE

Chris Nash
University of Leeds, United Kingdom

INTRODUCTION

The aim of this paper is to draw on those aspects of European experience of intercity passenger services that may be of relevance in the U.S. context. We first consider the policy background in Europe. We then discuss factors affecting the demand for intercity travel, with particular reference to high speed trains. Finally we examine privatisation, concentrating on the experience in Britain which is the one country in Europe actually to have privatised its intercity trains, before reaching our conclusions.

POLICY BACKGROUND

Rail passenger services in Europe command a market share which averages around 6% of all passenger kilometres travelled, and is declining. Nevertheless, rail passenger traffic continues to grow in absolute amount in many European countries, and is seen as important in a number of contexts:

- Urban and suburban services are very important in big cities—over 70% of the one million people who commute into central London daily use the train, for instance.
- On intercity corridors where rail offers door to door journey times competitive with air, it carries a large market share, particularly for business traffic.
- In both the above markets there is strong political pressure for an increase in the rail market share to reduce the problems of congestion and environmental pollution that beset both the road and air modes in Europe.
- Even regional and rural services, where the market share is small, are politically very sensitive, and any proposals to withdraw services are hotly contested.

The result is a general acceptance that governments will wish to intervene to ensure at least minimum provision of services and will provide subsidies as a way of achieving this. Typically European railways get around half their revenue from passengers and the other half from the taxpayer. (Nash and Preston, 1994). There is also a commitment to investment in a Europe wide high speed rail network, much of which is marginal in social cost-benefit analysis terms and only a small part of which can be financed on a purely commercial basis (CER, 1989).

The European Commission has long been concerned by the level of subsidy going to the rail sector, and by its loss of market share. The most recent White Paper on Railways (CEC, 1996) proposes the following as a way forward:

1. Separation of infrastructure and operations at least into separate divisions of the state owned railway if not into totally separate organisations.
2. Railways to be independent commercial organisations with all social obligations paid for by governments on a contractual basis.
3. Introduction of market forces. In the passenger sector it promises further study of the best way to do this, but suggests some form of franchising of local and regional services, and open access for new operators to provide competitive services using existing infrastructure on long distance routes.

However there are few countries that have actually moved towards open access for passenger services as yet and no country in which open access for passenger services has led to significant new entry (Lovers Rail, in the Netherlands, is the only open access passenger operator of which I am aware). On the other hand, a number of countries, including Sweden, Germany and Britain, have introduced franchising of local passenger services. Only Britain has extended this to intercity services, now having all intercity services operated by privately owned companies, on a franchise basis for national services and by means of outright privatisation in the case of Eurostar services through the Channel Tunnel to France and Belgium.

DEMAND FOR HIGH SPEED RAIL

One of the principal ways in which governments are seeking to expand the rail share of the market is by introduction of new high speed services. The potential market for high speed rail may be divided broadly into business and leisure travellers. Business travellers are usually travelling at their company's expense, and are willing to pay highly for speed, comfort and convenience. Door to door travel time is the key variable in determining their choice of mode. Such travellers almost always have cars available, and for shorter journeys, the door to door convenience of the car is hard to beat. If cars on motorways can be taken to average say 100km per hour, then rail must be sufficiently faster to offset

the extra access and waiting time involved. If this typically amounts to something of the order of 1 hour, then on a 200km journey, rail would need to be faster than 200km per hour end to end to beat car; on a 300km journey, 150km per hour would suffice. Obviously, the higher the rail speed, the greater the catchment area for which the rail service can compete with car (see Fig. 1).

This suggests that rail will be quite competitive with car for long distance journeys even without very high speeds. However, over longer distances it is air that is the main competitor. Given typical access and egress times from airports, it is rare to achieve a city centre to city centre time by air much below 3 hours, however short the journey. Thus the three hour journey time is often seen as an important watershed for rail services. If rail can achieve a journey time below this (amounting to an in-vehicle time of less than 2 hours more than air) it will gain a dominant market share (Table 2). However, it is important to recognise that many business trips will have one or other end located out of the city centre, so that some access time for the rail service must be added on as well. The lower the rail journey time falls below 3 hours, again, the greater the potential catchment area for the rail service. On the other hand, where there is no direct air service, or frequencies are poor, rail may compete in the business market with substantially longer journey times.

The leisure market is generally much more price sensitive, with lower values of time. Nevertheless, improved rail speeds may lead to some substitution from the main leisure competitor—the car- as well as some diversion from coach amongst those with no car available. It is also in the leisure market that one would expect that the potential for generating totally new trips, for instance by making a day or weekend social or recreational trip feasible where it was not before, would be highest.

The first real opportunity to measure the change in patronage resulting from a major acceleration of services in practice in post-war Britain was provided by a before-and-after study of the West Coast Main Line electrification in 1966 (Evans, 1969). This was based on one-day surveys of traffic conducted on all modes; not an entirely satisfactory approach given the large day-to-day variation in patronage, although it had the merit of allowing estimates to be made of whether the additional patronage had changed mode or was wholly new business. The estimated change in traffic, and the mean change in journey time, is illustrated for some of the major flows in Table 3. Generally traffic rose by some 25-50%. It is seen that the percentage increase in traffic generally exceeded the percentage time saving. A regression of the percentage change in traffic on the percentage change in journey time produced an elasticity of -1.3; that is to say that on average a 1% reduction in journey time had produced a 1.3% rise in traffic. Examination of the other modes suggested that there had been a substantial diversion of business traffic from air, but little diversion of business or leisure traffic from road. Presumably, then, most of the additional rail leisure traffic consisted of journeys which would not otherwise have been made by any mode.

In the 1970's, services on non electrified routes were greatly improved by introduction of 200 km. p.h. diesel trains. Initial monitoring work within BR concentrated on use of the "control flow" technique. Under this method, no attempt was made to explain actual changes in patronage over time. Rather, each route on which services had been improved was compared with one or more unimproved routes which displayed a similar path in traffic over time up to the time of improvement of the first route (Shilton, 1982). Since then, application has been made of time series regression analysis in two studies at Leeds University. The first used annual data on flows between all major conurbations over a 10 year period—a total of some 45 flows (Fowkes, Nash and Whiteing, 1985). In a pooled time series/cross section model, year on year percentage changes in traffic were regressed on a variety of explanatory variables, including fares, average earnings and car ownership. The effects of major service changes were estimated by use of dummy variables. This procedure combines some of the features of control flow analysis with regression analysis. Important variables are introduced explicitly, but any systematic unexplained growth in traffic will also be disallowed when estimating the effect of service variations. The mean effect of the High Speed Train on traffic was found to be of the order of 15% growth in traffic over the course of 2 years; that of the extension of the West Coast Main Line electrification to Glasgow was slightly higher. The results are summarised in Table 4.

In the second study, time series regression was applied to individual origin-destination pairs, using 4-weekly data (Owen and Phillips, 1987). The wide range of results obtained for the effects of the High Speed Train is illustrated in Table 5. The biggest effects were found at Bath and Swindon, which as well as enjoying the greatest improvement in service, are the closest stations in the sample to London. The increase in traffic may therefore include some commuting from areas which were previously thought to be outside the London commuter belt. Increases on the East Coast route to York and Leeds are rather lower, whilst to Plymouth (a route dominated by leisure traffic, and over which the full speed potential could only be used for a short distance) no significant effect could be found. It is interesting to note the degree to which increases were greater in first class traffic than in second; this of course implies that the total increase in revenue will be considerably greater than the increases in traffic. The overall impression created by the studies of the High Speed Train was of a journey time elasticity of the order of -0.8. That is, a 1% rise in speed was accompanied by a 0.8% rise in traffic.

The evidence from the French Paris-Lyons TGV is

helpful here, as well as relating to a truly high speed service. The overall growth in rail traffic in the corridor amounted to some 75%, at a time when intercity rail travel elsewhere in France was stagnating. (Farber, 1990). This suggests a journey time elasticity considerably higher than for the British high speed train. At the same time surveys suggested that of this traffic some 33% had diverted from air, 18% from road and 49% was generated.(Bonnafous, 1987). This suggests that the high speed train is more successful in competing with air than with the car; it is also consistent with the hypothesis that there is a high degree of generation of new traffic, which we would expect to be mainly leisure. Whilst the key origin destination pair of Paris and Lyon is well within the 3 hour rail journey time threshold, substantial traffic increase has been experienced on much longer journeys such as that to Marseilles (5 hours) and Nice (7 hours).

The overall conclusion then is that in European conditions, high speed trains can substantially increase rail market share, with a big impact on air traffic but a more modest impact on roads. It should be noted however that rail may be more successful in taking traffic from other modes if either external circumstances or deliberate policies worked to encourage this (higher costs of motoring, increased congestion, reduced airport capacity for short distance flights etc).

PRIVATISATION—THE BRITISH EXPERIENCE

Following nationalisation in 1948, all main line rail services in Britain were provided by a single government owned enterprise, British Rail. This is the norm in Europe. However, there has been growing interest in privatisation, particularly in Great Britain. After a remarkable performance in the 1980's, when real subsidies were halved and services expanded at the same time, subsidies began rising again in the early 1990's (Table 6). (Reasons for this were the downturn in the economy and heavy spending on safety following the Clapham disaster (Nash and Preston, 1992)). The 1993 Railways Act provided for the privatisation of British Rail in the form of franchising of passenger services and outright sale of all other parts of the business. The privatisation was unusually complex, with the existing single organisation being divided into more than 80 separate companies, the intention being to create competition not just in the form of competing train operating companies, but also for the supply of services such as rolling stock and track maintenance, wherever possible.

As from April 1 1994, the rail industry was substantially reorganised ready for privatisation. In particular, Railtrack was set up as a separate publicly owned company to own and manage the infrastructure and sell access to it to train operating companies. Initial track access charges for passenger operators were determined by the Department of Transport on the basis of recovering all costs including replacement of assets and a rate of return of 5.6% on the modern equivalent value of the asset base, to be gradually raised to 8% (Nash, 1996). Charges took the form of a high fixed charge, plus a low variable charge per train kilometre, varying with the type of stock, the latter simply designed to recover wear and tear costs (and the cost of electricity where electric traction is used). Freight charges were to be negotiated on a flow by flow basis according to what the traffic could bear, as would charges for new open access operators and for changes in the access arrangements for existing operators. A new body, the Office of the Rail Regulator, was set up with various responsibilities including regulating track access charges. In his first review, the Rail Regulator determined that the track access charges for passenger services were higher than was necessary for Railtrack to meet its commitments and should be reduced by 8% immediately, and by a further 2% per annum up to the year 2000. (ORR, 1995). In May 1996, Railtrack was privatised by the sale of shares, raising a total of nearly £2b.

At the time Railtrack was set up, many of the Train Operating Companies reported considerable concern about the loss of control over key assets which determine their quality of service. However, as part of the subsequently negotiated track access agreements, a performance regime was included under which Railtrack has to compensate Train Operating Companies for delays or cancellations which are its responsibility and vice versa. Thus Railtrack has a very direct commercial interest in ensuring a high standard of performance. It is reported that punctuality and reliability have generally improved under the new regime which seems to be working well. However, operators continue to complain about slowness in negotiating changes to access arrangements, and—partly to speed up the consideration of new flows of traffic—the new freight operator is understood to be seeking to put its charges on the basis of a two part tariff similar to that faced by passenger operators, rather than the existing flow by flow basis.

More concern has been expressed about the level of investment. The Regulator determined charges at a level which should permit the renewal of assets so as to at least ensure the continuation of rail services at current levels and qualities. However, he has expressed concern that investment is not taking place at the necessary rate. The pressure on Railtrack to renew its assets comes from the fact that otherwise in the longer term its performance will deteriorate, triggering penalty payments. Doubts have been expressed about whether this is an adequate incentive, and the Regulator has threatened further action if he is not satisfied with Railtrack's performance in this respect.

At the same time as Railtrack was set up, the passenger rolling stock was placed into three new companies (the

ROSCOs), and leasing agreements were set up between these and the various Train Operating Companies, which were at the time still within British Rail. These were based on charges which again included depreciation at replacement cost and interest, but with an offsetting reduction in the case of older stock on account of its higher operating and maintenance costs. These companies were privatised by outright sale, in two cases to Management Buyouts and in one case to an international financial consortium, raising a total of some £1.8b. Both management buyouts have since been taken over at substantially increased prices, in one case by Stagecoach, which is also a train operator, raising issues for competition policy as the company concerned leases rolling stock to Stagecoach's rival train operators. The takeover was permitted to proceed on condition that the ROSCO continued to be managed as a separate company and did not favour Stagecoach over other operators in its leasing terms.

Rail passenger services were reorganised into 25 Train Operating Companies to be franchised out to the private sector. Responsibility for the franchising process rests with another new body—the Office of Passenger Rail Franchising (OPRAF), which sets minimum service standards (the Passenger Service Requirement) in terms of frequency, speed, and in some cases other criteria such as reliability and crowding, as well as controlling certain fares. OPRAF then invites bids in terms of the subsidy per annum that operators will require to run the services, usually on the basis of a 7 year franchise, but with the option of a longer franchise incorporating specific investments.

Generally the Passenger Service Requirement stipulated services close to current levels for unprofitable services, but gave more freedom to operators where services were closer to commercial viability. In the case of London commuter services the emphasis was on the level of capacity provided during the peak. OPRAF has a duty to develop systematic criteria for taking decisions on support, and late in 1996 it published a consultation document suggesting that these should be based on a form of cost-benefit analysis, although ignoring user benefits when it was felt that these could be captured by the operator as revenue, and looking more broadly at environmental and economic implications of major projects (OPRAF, 1996). Clearly there was not time to develop these criteria in the first round of franchising, and therefore franchises for up to 15 years have been entered into more on the basis of preserving something close to the status quo than on the optimal use of support. Perhaps this was politically inevitable anyway, regardless of time constraints.

The franchising process started with Great Western and South West Trains, which started operation in February 1996 and was completed early in 1997. It is thought that the franchise was almost always awarded to the lowest credible bid; the successful franchisees and their bids are shown in Table 7. Whilst the first two bids promised relatively low rates of reduction of subsidy, bids have become progressively more optimistic, culminating in the biggest and most complex franchise, Intercity West Coast, which was won by Virgin, promising to turn a £77m subsidy in the first year into a £220m premium payment to OPRAF in the last year of a 15 year franchise. Whilst the more ambitious bids clearly rely heavily on generating substantial increases in passenger revenue (in this case as a result of introducing faster services operated by a new fleet of tilting trains), it appears that also substantial cost reductions are anticipated and a start has already been made. For instance, several operators report a reduction in the number of drivers of the order of 30%, resulting from measures such as greater flexibility in shift length and an ending of the requirement that trains travelling at more than 110m.p.h. have two drivers in the cab.

Although a relatively small number of organisations were involved in bidding, the bidding appears to have been very competitive, with several serious bids for each franchise. The nature of the winning organisations is summarised in Table 8. It is seen that the bus industry dominates the scene, with a small number of successful management buyouts, a French conglomerate, Virgin, Sea Containers and a consultancy led company the other players. The dominance of the bus industry has raised concerns about lack of competition where the franchisee is also the major bus operator in the district. One case, the takeover of the Midland Main Line by National Express, which also operates almost all the express coach services from the area in question, has been referred to the Monopolies and Mergers Commission, but National Express was permitted to retain both sets of services on giving undertakings that trends in future price and frequency of express coach services on the routes in question will be no less favourable than on its network as a whole (MMC, 1996).

Assuming a linear rate of decline of subsidy, over the first 7 years the annual demands on the exchequer should be reduced by some £1,000m (Table 9). However, it is worth remembering that the new basis of charging for the use of infrastructure and rolling stock described above led to the subsidy bill rising from £1.1b in 1993/4 to £2b in 1994/5 (Table 10). It will thus be several years before subsidies return to the level they were at before the process started in 1993/4. In addition, there have been major transition costs, and the operating costs of OPRAF and ORR must be taken into account. On the other hand, the taxpayer has benefitted from the proceeds of the sale of Railtrack, the ROSCO's and the other constituent parts of BR (maybe some £4.3b, but the costs of the privatisation process of at least £0.25b must be deducted from that—see Modern Railways Informed Sources, January 1997) and the payments should provide for a higher level of investment than has been the case in the past. It thus appears that, unless a high rate of subsidy reduction could have been achieved by British Rail without privatisation the

net outcome should not be the sort of big increase in costs that was initially feared, and may even be beneficial for the taxpayer, although not nearly as much so as implied by a simple examination of the trends in support in the franchise agreements. This also presupposes that these reductions in support are actually achieved. Some commentators include writing off of debt as part of the cost of privatisation, but we are only interested in the net effect on cash flows, and it is unlikely that interest on debt would have exceeded future borrowings.

Whilst there was a virtual halt to new projects, particularly rolling stock replacement, whilst the privatisation process was underway, many of the franchise agreements do provide for substantial investment. These include substantial amounts of new rolling stock on the London Tilbury and Southend Line, South East Trains and Cross Country, and tilting trains for the West Coast Main Line, in conjunction with substantial renewal and upgrading by Railtrack. Elsewhere, innovative service patterns and higher frequencies have been offered, including the provision of a semifast service on the Midland Main line which will virtually double the number of train miles run. Again it should be remembered that British Rail itself had a record of introducing innovatory new and improved services particularly in the late 1980s so it should not be assumed that none of these innovations would have happened without privatisation. Moreover there are some developments which disadvantage passengers, such as more restrictions on the availability of fares by alternative routes, fewer cases of holding of connections (of course this actually benefits some passengers) and problems with the provision of passenger information. Overall, however, it seems unlikely that passengers will be seriously disadvantaged by the changes if franchisees fulfil the conditions of their franchise agreements.

In addition to the three main business sectors described above, the privatisation has taken place of many other companies formed from parts of British Rail. Foremost amongst these are the infrastructure maintenance and renewal companies and the rolling stock heavy maintenance companies. These were sold to a mixture of existing engineering firms and management buyouts. Amongst the other companies privatised are included BR Business Systems, (responsible for computer and ticket issuing systems), BR Research, Rail Operational Research, engineering design offices, marketing organisations and many others.

A different approach was taken with the so-called European Passenger Services (EPS) division of British Rail, which was the British partner in the operation of the Eurostar services via the Channel Tunnel to France and Belgium. This was offered for sale as part of a package whereby the owner would be committed to the design, construction and operation of a new high speed link from London to the Channel Tunnel. The winner of the competition was a consortium called London and Continental Railways, including as well as construction companies Virgin and National Express (both now domestic rail operators). In return for a commitment to build the line the consortium was provided with the existing assets of EPS (including the fleet of Eurostar trains and much property) and a substantial cash grant.

It appears from the above description that the privatisation process has been completed remarkably smoothly, in an extraordinarily short period of time. In part this has been the result of a pragmatic approach to actual implementation which has seen many departures from original intentions—for instance, OPRAF has been willing to award longer franchises in return for promises of investment and open access has been limited, at least until 2001. There are certainly areas which remain of concern. For instance, surveys undertaken by the Consumers Association has found that the quality and impartiality of information on fares and services provided by one operator about another has been poor. Whilst many of their examples are extreme cases where cheaper fares available on very limited and unattractive services have not been mentioned, some are not, and the Regulator clearly perceives there to be a problem (ORR, 1997). Another concern surrounds the inability of one of the first franchisees—South West Trains—to fulfil its Passenger Service Requirement regarding levels of service following a too rapid reduction in the number of drivers. An emergency timetable, cancelling many services, was introduced. Of course, Stagecoach will pay penalties to OPRAF for failing to fulfil the terms of its franchising agreement, but this early example of a new operator appearing to place cost cutting above its duty to provide services has renewed fears that service levels may suffer as a result of privatisation.

Looking ahead, there remain potential problems. One surrounds the intention of the Regulator progressively to move towards open access for passenger operators (with the exception of Intercity West Coast services, where in return for the high level of investment required, protection from competition will continue throughout the 15 year franchise). Other work we have undertaken suggests that, whilst head on competition will tend to be unprofitable for the entrant, cream skimming entry with a few key trains may be profitable, and reduce the profits of the incumbent even if they are successful in retaliation. Scope for this may be limited by lack of track capacity unless incumbents are forced to surrender paths, however, as obviously cream skimmers would be looking for peak hour paths into the main termini. The most likely entrants of this type would be neighbouring franchisees.

It can be seen from Table 9 that several franchisees are committed to a 7 year subsidy reduction which is more than 50% of current turnover. For some, this will rest heavily on cost reductions but others are projecting big increases in

revenue. This raises the more general issue of what will happen if the franchisees are unable to secure the ambitious targets in terms of revenue increases on the basis of which many of them have made their bids. Apart from increased competition, the most likely cause of this is a downturn in the economy. In this situation, they have the right to reopen negotiations with OPRAF on the terms of their franchise, and if the problem is genuinely due to circumstances outside their own control, it appears likely that OPRAF will agree to some combination of cuts in services and increased subsidy. Should a franchisee become insolvent, then OPRAF would also obviously have to secure a replacement operator, and again the cost of this might be increased subsidies, poorer services or both. The cost and difficulty of this might well incline OPRAF to renegotiate subsidies and service levels rather then face this situation. Many sources in the industry believe that bidders assumed this to be the case in making such favourable bids. If they are only able to secure this performance in the face of favourable economic circumstances, then this reinforces the point that the achievement of British Rail in the favourable economic climate of the second half of the 1980's, where it halved subsidies whilst expanding traffic, should also not be forgotten. It is quite possible that a major reduction in subsidy with improved services could have been achieved without privatisation.

CONCLUSION

It must be for others more knowledgeable on the American scene to determine how much of the above experience is relevant to the US. Clearly there are a number of differences between the European and U.S. scenes:

1. Whilst there is evidence that intercity rail passenger services may be both socially and financially worthwhile in European conditions, the combination of long distances and low densities makes the US a much less favourable environment for rail passenger operations. Nevertheless there are city pairs at distances where rail should be able to command a high market share, particularly in the North East corridor, and potential for niche markets elsewhere.

2. The apparent success of franchising in Great Britain may make this an attractive proposition as a way forward for US passenger services. Franchising certainly appears to be an effective way of harnessing the forces of competition in a situation in which it does not make sense to have competing operators on the same track. However:

- Would there be as much competition in the US as in Britain, where much of the interest has come from major bus companies? Of course the US has a potential source of operators not possessed by Britain in a number of private sector rail freight operators, but would they be interested in passenger marketing?
- U.S. inter-city services outside the North East corridor are extensive low frequency operations.
- Would it be possible to devise a franchising plan which offered attractive sized franchises, offered potential for exploitation of economies of scale and network benefits and yet offered enough separate franchises to sustain a number of competing companies in the business? Rather little is known about the degree of economies of scale for specialised passenger operators of this type.
- Will franchising turn out to work as well as it appears, or will there be extensive attempts at renegotiation and a failure to achieve the promised gains?

That is the ultimate question, for which we will have to wait some years for an answer.

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