

EUROPEAN HIGH SPEED RAIL PASSENGER SERVICES:
SOME COMMERCIAL PERSPECTIVES

David HOLLINGS

Director

Accent Marketing & Research
London, UK

Robert SHELDON

Managing Director

Accent Marketing & Research
London, UK

1. INTRODUCTION

The authors of this paper also wrote "European Railways - Prospects for Long Distance Passenger Services in the 1990s", one of the Special Reports of the Economist Intelligence Unit published in late 1991.

The basis for many of the conclusions of the Report was a series of marketing and market research studies most of which, for obvious reasons, are not published or generally available. The E.I.U. Report does, of course, use published information in support of the conclusions and contains a list of sources. However it should be understood that the conclusions are drawn from a deeper level of research and from a broad range of confidential discussions.

Similar observations apply to this Paper. Indeed, they are stronger because the Paper is exclusively concerned with the commercial issues related to the construction, marketing and selling of high speed rail services. Naturally, the research studies and discussions which provide insight into this particular area are even more confidential than those which relate to the railway industry in general or to developments in technology.

What the authors wish to contribute, to what they believe to be an important debate, are the following propositions or contentions which they consider should command as much attention as those related to technology, investment and the political frameworks. These propositions can be summarised as follows:-

(i) The present and foreseeable future political climate is that investments in high speed rail services will be regarded as justifiable only when the resulting services can generate a level of revenue sufficiently above operating costs to cover interest on most of the investment.

External investment funding will only be secured in circumstances in which traffic is captured from other modes or in which regional investing authorities believe the new services will bring other major travel related economic benefits. (The proposition is not examined in the Paper since it is thought to command recognition)

(ii) The magnitude of the costs of investment in high

speed rail services coupled with relatively small envelopes of genuinely competitive market opportunities will act as a constraint upon the number of corridors within which they will be provided. (Section 2)

(iii) It is too readily assumed that speed is the most critical marketing feature for the new services. Accessibility, both in the physical sense and also in terms of user friendliness may well be as critical to optimum market penetration as marginal increments in speed. (Section 3)

(iv) The quality of service features and facilities which should be provided on board high speed services, although they must be delivered with the maximum of quality, are more modest than many operators and designers envisage. (Section 4)

(v) Commercial and market research should be re-oriented in a disciplined way towards establishing criteria for ease of access to services and, in relation to quality of service characteristics, used less to establish aspirations and more to understand behaviour and responses within the travelling environment. (Section 5)

2. THE HIGH SPEED RAIL SERVICE BUSINESS

It can be confidently predicted that a rising volume of public funds will be invested in urban and sub regional rail transport in future decades. Conversely, the strong probability is that high speed passenger (and freight) rail services will qualify less and less for support from public funds. In any event, whatever the source of funding, the criterion for investment will be related to the financial rate of return.

An increasing number of railways and their governments are identifying medium and long distance passenger rail services as a sector which should be commercially viable. The development of the TGV services of SNCF is shaped by the estimated rate of return and BR InterCity in the UK has for several years described itself as a business. The furore surrounding the development of what will Britain's only high speed line, the link between London and the Channel Tunnel, represents more than a Thatcherite attitude to public funding. It symbolises a widespread belief in the European Community that the initiatives for investment in this sector should be commercial shared between the railways and private sector funders and a variety of other institutions rather than be a call upon central government funds.

If this scenario, as is probable, is the realism of the future, it confers a discipline upon some of the more unrestrained visions of a future high speed rail passenger network.

In absolute terms, the costs of the construction of new lines, permitting operating speeds of 300 kms per hour, are substantial. Examples, unadjusted to contemporary values, are illuminating.

Table 1: Costs of New Line Construction

| Route | Railway | Cost £ million |
|----------------------|---------|-------------------|
| Hanover - Wurzburg | DB | 3,750 |
| Mannheim - Stuttgart | DB | 1,200 |
| TGV - Paris Sud Est | SNCF | 955 |
| TGV - Nord | SNCF | 1,200 |
| TGV - Est | SNCF | 1,100 |
| West Coast Main Line | BR | 2,300 |

Sources: DB, SNCF, BR

Of these examples, the first three represent lines already constructed, the fourth is being constructed by SNCF, the fifth is under review and the last has been rejected in favour of an upgrading of the existing line for a 250 kph operation.

However carefully estimated, the costs of new line construction are subject to upward pressures, because of the increasing power of local lobbies and environmental groups.

Available evidence suggests that the procurement of high speed rolling stock requires between one and a half and twice the levels of investment in stock able to operate at up to 250 kph. For rolling stock, including traction equipment able to operate over the new lines and other infrastructures of different national railway systems the costs rise to more than 2.5 times the costs of trainsets operating within national 250 kph speed limits.

Accepting the Community of European Railways' (CER) convention that rolling stock represents about one third of the total investment in track and control systems and trains, it is evident that the costs of investment in high speed services are of a formidable dimension. (The current cost of a TGV trainset is estimated to be in excess of £10 million, the ICE trainsets were stated as costing £16.5 million each and TGV style trainsets to be operated between London, Paris and Brussels are costing around £17 million each.)

The high capital costs of new lines and new rolling stock can clearly only be justified if both are intensively utilised.

The new lines in Germany are already used by 34 trains a day whilst the TGV new lines accommodate 50 or more operations a day. The trains themselves need to achieve 30-40,000 kilometres per month in order to be economically viable. Naturally, the larger the train capacities the lower the rate at which seat-kilometres are generated but this proposition applies equally to air service and to lower speed rail services.

Essentially, therefore, investment in high speeds can only be sustained if significant volumes of passengers can be attracted to rail from other modes. Implicitly, because of the high investment and operating costs (admittedly, defrayed partially by the beneficial effects of speed upon the costs of capacity generation), the average yield per passenger will also need to be comparatively high.

Not since the 19th century have railways intercepted the total demand for travel. New lines and high speeds technically dictate provision for corridors and from limited calling points. The markets for high speed rail services are point to point passenger flows. Moreover, the attraction of high speed from rail is contained within a narrow travel time envelope relevant to dense traffic flows.

Table 2, drawn from the International Railway Journal, September 1989, demonstrates how the attraction of high speed rail declines as its absolute travel time increases.

Table 2: TGV Sud Est Route Air and Rail Shares

| Sector | Daily Air + Rail Pass. | TGV Passengers | TGV Share % | TGV Travel Hrs | Time Mins |
|--------------------|------------------------|----------------|-------------|----------------|-----------|
| Paris - Lyon | 14,000 | 12,600 | 90 | 2 | 00 |
| Paris - Grenoble | 2,200 | 1,500 | 67 | 3 | 12 |
| Paris - Geneva | 3,100 | 1,700 | 54 | 3 | 21 |
| Paris - Marseilles | 8,200 | 4,000 | 49 | 4 | 40 |
| Total | 27,000 | 19,800 | | | |

Source: SNCF 1989

SNCF estimates that it achieves a 15% rate of return on the TGV Sud Est investment. The return originates from additional passenger volumes and the capture of the high revenue yielding business travel segments from air and car.

The latter represent only a proportion of the 45% additional patronage attracted by the TGV services not available to services operating in the 160 kph - 200 kph speed range.

However, the contribution to revenue is more than proportionate. The high costs of additional speed can clearly only be absorbed where large passenger flows exist, such as those shown for the accumulation of the sectors contained in Table 2. Indeed, large volumes are also pre-requisites for the provision of high frequency to achieve efficient levels of utilisation and to provide a commercially attractive service.

Beyond the high speed lines being constructed and planned to connect the major cities in Northern Europe it appears very doubtful that there can be many other corridors which would qualify to be developed as business propositions.

3. ACCESS TO THE HIGH SPEED RAIL NETWORK

The offer created by high speed rail services is the promise of rapid, nearly sensation free, movement without stress over significant distances. It is a promise with a high level of emotional appeal. The passive experience of being carried is attractive compared with the active experience of driving and attractive compared with the constraints upon personal space and the episodic experience provided by shorter distance air services.

Associated, however, with the promise of a nearly ideal form of medium distance travel are the issues and potential difficulties which arise from the conditions of entry or access to the high speed rail services. Transport planners epitomise these issues in physical or economic terms examining the distances, times and costs involved in gaining access to the high speed services. These aspects have the merit of being objective and quantifiable but they both understate the nature of the issues and may distort the conclusions which are to be drawn.

Much more difficult to measure are the psychological costs of access. In particular, it is helpful to separate access into the components of planning and execution. Is it not a paradox that as the speed of medium distance rail services increases they become more difficult to use? For example, the number of calling points tends to reduce, reservations may become obligatory, fares and supplements may vary by time of day and season of the year.

Even without added complexity, there is a battery of information to be acquired (and choices perhaps to be exercised) before a traveller can begin to finalise the process of planning the execution of the entry into the high speed rail services. The formal processes of communication are confined

to the provision of information about the services - terminals, routings, fares, reservations, timings, catering and other on board facilities.

If access to the home end station is to be made by public transport, a supplementary information source is normally necessary, which may nevertheless require the intending traveller to enlist personal judgment about the time that should be allowed for an intermodal interchange.

At the destination end the traveller is unlikely to have information about options for onward movement away from the station. Indeed, they may be forced into undertaking a gamble that information and facilities at the remote point will be adequate for the efficient execution of the onward transit.

Similarly, if access is to be made by car the traveller has to exercise judgments about access time and parking provision and the security of the car whilst away. There are, of course, also the issues about the level of parking charges and the media for payment.

The postulation being raised here is that reduction in rail transit times do not market themselves automatically. Speeded up transits arouse interest but new entrants to the rail services have a series of psychological obstacles to overcome before they become converts. New entrants have to acquire information and exercise choice and judgment before they can interface with the services at all, let alone do so efficiently. Viewed from this perspective, the restless search by operators to improve speeds may be less cost-effective than reducing the psychological demands imposed upon the first time users of a service, which may already be sufficiently fast to be attractive, but insufficiently simple to be approachable.

Furthermore, vis à vis the car option, it may not be the case that trunk route speeds by rail have an infinite capacity for expanding the theoretical size of the point to point catchment areas. Major rail terminals are by definition located in dense urban areas and are therefore difficult to access by car. Peripheral stations, like airports, are easier to access from residential areas. However, studies of 'Parkway' stations, for British Rail InterCity, indicated a rapid fall-off in catchment area penetration and mode diversion beyond a 20-minute driving access journey time.

A driver having been at the wheel for 40 minutes or more and probably at the point of intersection with an autoroute, autobahn or motorway is in no psychological mood to abandon the car mode in favour of a high speed rail service, just at the point where the car is achieving its maximum kilometres per hour.

Furthermore, research reveals that peripheral stations appeal much more to business than to leisure travellers, partly

because of the higher value of time of business travellers and partly because the parking costs are borne by third parties i.e. employers.

4. SERVICE CHARACTERISTICS

High speed rail services, as a result of the high level of capital costs, require to tap a broad market composed of high revenue yielding business trips and the less price elastic components of leisure travel. The key elements of the market are, therefore, short stay trips and day trips. Indeed, it is to these components that relatively high speed appeals.

It is the combination of speed and frequency which facilitates the optimisation of the value of time away or the corollary of minimising time away from home. The need for frequency also results from the operational drives to utilise track and rolling stock to the maximum feasible extent. The determination of frequency is a fine art involving the reconciliation of a number of factors.

Within the limits of station platforms and the make up of train sets, in general the greater the capacity of the trains the lower seat kilometre costs. Variable times from within the major catchment areas create a requirement for more than one morning departure and there is a similar requirement for a range of early evening return arrivals. Over the shorter distances, business and personal business trips, with the benefit of high speed services, are now manifesting that there is a "split day" market, i.e. for the execution of rapid engagements.

Many years ago, Stephen Wheatcroft in his book the "Economics of European Air Transport" demonstrated that market volume appeared to grow until frequency approached total journey time. However, if flows are dense then capacity limitations may require higher levels of frequency.

The nearest analogy testifying to the belief in the value of frequency is that the European airlines anticipate a switch from wide bodied short/medium haul aircraft to narrow-bodied aircraft operating more services in order to retain or win market share through frequency, following de-regulation.

It is, of course, true that business travellers can, other things being equal (although they rarely are on dense routes), be constrained into adapting to limited frequency and a significant element of the leisure travel market, being less sensitive to time, can be induced by price incentives to shift into narrow timebands for travel. However, there is clearly very limited opportunity for flexibility with respect to day trips for which high speed has greatest appeal.

There is a fortunate divergence between some of the demand

characteristics for leisure travel and business travel. The former peaks in the summer and at weekends when business travel displays troughs in demand. Nevertheless, both markets have a collision of demand on Fridays and Mondays. Moreover, unconstrained demand for day and short stay trips creates convergent pressures on peak capacity.

It is within these complementary patterns of demand that the availability of frequency provides the opportunities for sophisticated yield management. Whilst these may provide some possibilities for low fare travel, in no way are high speed rail services likely to be cast as a popular, democratic travel mode. They are, therefore, quite unlike urban mass transit systems catering for all sections of the urban community. Essentially, the high speed services are aimed at the relatively affluent.

It is jointly a function of the times at which high speed rail services operate and of the capacity they generate that they have to accommodate the business, personal business and leisure segments of the travel market. Utilisation demands that seven days a week over most of the fifty-two weeks of the year, services are operated. No single segment could generate an adequate load factor.

Research has demonstrated clearly that the business and leisure segments do not mix comfortably during transit. Although, as people they may be interchangeable, in the mood sets of their rôles at the time they travel they prefer to be segregated. Traditionally, this was achieved by first and second class but it is noticeable that BR InterCity and AVE in Spain have adopted a three tier class separation similar to that which airlines now employ, (although mainly over longer distances). The rationale for the airlines and for BR InterCity is that there is a substantial segment of the business travel market unwilling to opt into First Class travel but prepared to pay a premium for segregation from leisure travellers and the assurance of a minimum level of on board service.

Culturally, railways throughout the Western world appear to have a common difficulty in delivering a consistent standard of service. It is especially a problem to secure service delivery from the full range of all the uniformed staff with whom passengers interact at terminals and on board trains. Airlines, by contrast, are infused with the art, particularly on short sectors, of delivering well what is often a relatively modest level of service.

The passive experience represented by rail travel provides more personal space than is available on aircraft and the opportunity to pursue activities such as talking, reading, writing and dozing not available within a car journey.

Comfort, as delivered by seat design and the noise and ride characteristics of the trains is both the prior condition for the free pursuit of these activities and represents the unique selling proposition of rail services.

One other pre-condition is the provision of information which will relieve passenger anxiety.

Given the fulfilment of these conditions, the technology and ambiance of high speed rail services coupled with the perceived efficiency of the mode effectively deliver the quality of "relaxation". This quality ranks psychologically as the prime attribute of rail travel.

It is accepted that, depending upon the individual, there is a threshold within a timescale of two hours and half to three hours when that important quality of relaxation is eroded by that of encroaching boredom.

However, until the threshold is reached, both business and leisure travellers have the advantage of a hiatus which provides, in a relatively insulated environment, the opportunity to determine which activities to undertake. (On board phone and other communication systems represent a valued facility for overcoming the one disadvantage of this immolation.)

It was, therefore, startling to read the statement by Herr Johannes Neumeister of MAN Technologie AG (Public Transport - Design and Innovations, Winter 1992) that passengers "like entertainment". He is the designer of the T.I.S. (Train Information System) for the ICE high speed trains of DB. The research in which the authors have been involved would support this contention only in the sense that on board entertainment might be an effective medium for the relief of boredom amongst longer distance leisure travellers. Even then, there are problems because entertainment is very much a personal choice and passengers can react adversely to what they perceive as the choice range provided by the operator. Entertainment is an experience defined by the recipient rather than by the provider.

Some high speed trains run over long distances and the niche rail market (i.e. that not diverted from other modes) may welcome on board entertainment. However, over the distances and within the timings for which high speed rail services are highly competitive, the supply of entertainment facilities is, arguably, redundant. Better by far that they should be supplied to these passengers on the relatively slow Euro-City services with their attenuated routings and journey times.

No doubts are being expressed about the application of modern technology to provide the high speed rail passengers with guidance, information and communication facilities of a quality comparable to those employed in the operation of the

services. It is to be anticipated that hi-tech passenger facilities together with the exterior and interior stylings and designs will be important re-inforcers of the sales appeal of the services provided by the Three Capitalls, ICE and TGV trains.

Queries about whether the provision of entertainment is cost-effective extend also to the inclusion of dedicated areas for activities such as conferences. There is a concomitant sacrifice of peak capacity. The relevant question is not about who might use them but about whether they attract new traffic in their own right and whether other potential passengers are displaced or lost in the peak period.

Necessary sacrifices of payload have to be made to provide toilet and catering facilities and to provide communication facilities, telephones, faxes etc. There needs to be considerable caution applied to the extension of further sacrifices of peak payload capacity.

Probably, one justifiable encroachment is in the concept of the family coach. Children have a low boredom threshold and the family coach generates benefits to adults travelling without children as well as to those who are.

5. RE-ORIENTATION OF MARKET RESEARCH

British Rail InterCity's mission statement refers to its function as providing the 'most civilised' form of travel. Market research studies of public perceptions of various modes would confirm this positioning of rail as a means of travel.

Market research also reveals that as a travel mode it is seen to be relatively unfriendly. It demands of its customers a very high level of self processing and, during both the planning and execution phases of the journey that they act as selectors, filterers and interpreters of information. In short, the customer has to learn how to use the suppliers' services.

It is suggested that the whole area of the interface of the systems, procedures and communications media of the railways with the segments of the markets qualifies as a continuous priority for a major investment in market research. The justification is that, from the commercial viewpoint, the task of making railway services more approachable and enhancing the confidence of potential customers is simultaneously important and difficult.

It is axiomatic that market research is a tool for illuminating only the issues selected for it to study. The applications are determined, therefore, by the clients' cultures. Within the cultures of many railways are preoccupations with the technologies for operating at

progressively higher speeds and with the provision of on-board services which owe much to the style of airlines. Both types of preoccupation are understandable, bearing in mind the success which attends high speeds and the obvious need to attune the internal ambiance and service to the high technology of the structures which provide the motive power and the track.

Market research enlisted in support of such preoccupations can undoubtedly assist in determining the value to be derived from speed, the relative values for different forms of on board services and even the trade offs between the two.

Nevertheless, market research may be being misdirected. For example, in competitive corridors customers are purchasing the efficiency of the mode with the expectation of acquiring the bonus of the 'most civilised' form of travel.

From the commercial viewpoint the most important questions relate to understanding better the defects the market perceives in the efficiency of the overall journey package including the planning, the transaction and the journey execution. In the context of on board services and facilities the key issue is the better understanding of the real meaning of the perception of rail travel as being the 'relaxing' or most civilised form of travel. Does rail not need to exploit its 'unique selling proposition' rather than simply imitate the best practices of other modes?