Arthur D Little

Transportation Viewpoint

Flying on tracks

Network airlines moving into high speed rail operations

Air France-KLM and Veolia, a major European airline and one of the leading private operators of rail based passenger transportation, have announced the start of a new joint business concept: the offering of TGV-style high speed rail (HSR) services under Air France brand and livery from 2010 onwards. Introducing an airline operated railway service might represent an effort of Air France to recover the significant share of travellers European airlines have lost to competing high speed rail services. This Arthur D. Little Transportation Viewpoint looks at the key implications of airlines moving into high speed rail: What is the business logic behind airlines offering their own high speed rail services? What are possible characteristics of the competition between airline rail services and incumbent rail operators? What do airlines need to do in order to set up a feasible business model for HSR operations and how can rail operates answer this challenge?

European high speed rail services have become the travel option of choice for selected routes

In only two decades, Europe's dedicated high speed rail network has multiplied by more than twenty times to around 4.500 kilometres. In recent years, links between formerly isolated domestic networks have also been expanded.

By 2015, the rail system will once again have doubled in size to an estimated 10.300 kilometres and efforts towards an integrated European network will have made considerable progress.

This increase in scope as well as significant quality enhancements, reduced travel times being the most important, are matched by increasing customer recognition and demand. On city connections with new or upgraded HSR services, modal-splits have been shifting considerably towards rail operations – to the point that airlines reduce competing short-haul flights or even abandon air services at all.

But not only passenger numbers of long-distance train operators are increasing, business performance is improving likewise. The operating margin of DB Fernverkehr, the HSR division of Deutsche Bahn, has improved by 40% (to 3,8%) in 2007 and SNCF's long distance operations has been able to achieve an operating margin of almost 10% in the same year.

Short-haul feeder flights in misery – Increasing costs and deteriorating yields put pressure on network airlines

In addition to increasing high speed rail competition due to network and product upgrades, short-haul flights are facing increasingly strong headwinds from consistently high energy costs, growing slot-constraints at major European hub airports and environmental efforts to contain green house gas emission.

Short-distance feeder flights have always suffered from unfavourable operating characteristics: Small planes used on short routes hardly allow for economies-of-scale in flight operations, energy intensive take-off and approach flight patterns consume a considerable amount of flight time and the total flight time itself is limited due to a high proportion of turnaround times on ground. This all adds up to low aircraft/ asset utilization and results in over-proportionally high costs per available seat kilometre (ASK) on short-haul flights.

Although the number of direct long-distance air services between secondary airports has been increasing recently, hub-and-spoke operations still are the centrepiece of network airline operations in Europe. The feeding-function provided by many short-haul flights therefore is of elementary importance for the hub-and-spoke business model of many European network airlines such as Air France-KLM and Lufthansa.

The outlined development in European rail and aviation markets however may give rise to a new business model. High speed rail may have become a viable alternative for airlines to substitute short-haul and feeder flights by own HSR services.

Strategic network options for airline high speed rail services

Two fundamentally different competitive options for airlines moving into HSR operations can be identified:

- **Network-wide competition:** Head on, network wide competition with incumbent rail operators

Integration in airline operations will be pursued where feasible, but is not a prerequisite. Focus is on airline brand transfer and leveraging customer related airline expertise such as yield-management, customer service and loyalty schemes (Figure 1). The market entry barriers can be lowered by smart-partnering models, such as Air France-KLM/ Veolia's joint venture plan.

- **Focus & Integration:** Competition with incumbent rail operators focussed on specific routes

Airline rail services are focussed on substituting feeder flights to hub airports. Rail operations are concentrated on key feeder routes and are fully integrated in the airline's flight operations, i.e. airport railway stations as main stops, platform check-in, through baggage, yield-management and joint ticketing system etc (Figure 1).

As we expect the second one to be a likely scenario in multiple European countries, we will take a closer look at this option in the following case study. Here, the hypothetical implications of high speed rail traffic operated by a major German airline will be discussed.

The business logic of substituting air by rail – a case study of a German air carrier operating its own high speed trains to Frankfurt airport

For the case study, we assume that a major German airline joins the ranks of high speed rail operators in order to substitute domestic feeder flights to its main hub airport in Frankfurt. Some key assumptions that build the foundation for further considerations are:

- Strategy of focus & integration – Replacement of short-haul feeder flights and full integration in the carrier's hub operations at Frankfurt airport
- Joint venture with an existing rail operator
- "Flying on tracks" – Airline style travel experience with seamless rail to air connection
- Use and leverage of existing airport rail infrastructure, especially at Frankfurt airport, and cooperative behaviour of airport operators
- Train routing from Dortmund to Stuttgart via Frankfurt airport, calling at major en-route destinations such as Duisburg, Düsseldorf, Cologne and Mannheim
- Mandatory ticket reservation, but possibility of on-platform ticketing and check-in

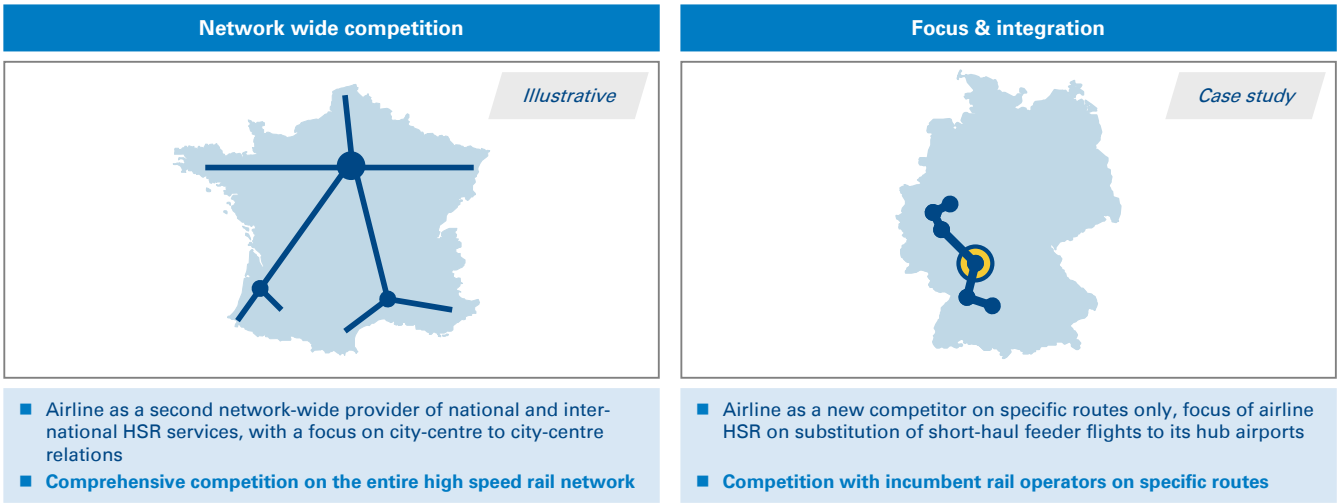
In order to evaluate the feasibility of such airline rail operations, we will take a closer look at two key elements that are of decisive impact.

Capacity & Utilisation

Airlines enjoy a significant advantage over other potential new entrants to the high speed rail market. They already manage considerable passenger flows between key catchment areas served by HSR and can therefore rely on an existing customer base that can be transferred from one medium of transport to the other.

Replacing feeder flights by scheduled rail operations will however

Figure 1: Two polar scenarios define the competitive landscape of airlines moving into high speed rail operations



Source: Arthur D. Little Analysis

increase the capacity offered by an airline significantly as, for example, each ICE3 trainset offers around 450 seats (two class configuration), compared to an average 110 on feeder aircrafts commonly used.

The same logic applies to the case study airline's capacity on its routes to Frankfurt airport, which will increase by roughly seven times when flights are replaced by rail services (figure 2). In order to offer a competitive travel alternative to existing Deutsche Bahn trains, we assume the airline to run a single unit trainset at regular two hour intervals. This results in a fixed minimum capacity of rail services that cannot be altered significantly and cannot be filled by existing airline customers alone (figure 2). The key question is: Will the airline be able to attract additional customers to make rail operations economically feasible?

Our analysis of current Deutsche Bahn schedules shows that the described airline rail service implies a rather incremental increase of total rail capacity on the considered routes to Frankfurt airport of roughly 10% (Figure 2).

According to industry studies and our own research, break-even load factors for HSR operations are typically in the range of 50 to 60%. By redirecting existing air and AIRail customers to its newly setup rail services, the airline would be able to supply around one third of the passengers needed. The other two thirds however need to be enticed away from competing Deutsche Bahn trains.

Although this seems quite ambitious at first sight, we believe that an airline stands a good chance in attracting customers of the incumbent Deutsche Bahn in significant numbers as we see some important competitive advantages to the airline's favour. These are for example related to customer-management activities, most notably the airline's hugely successful customer loyalty scheme, and will allow not only to attract feeder traffic to Frankfurt airport, but also to serve high-yield point-to-point demand between en-route destinations.

Costs & Yield

Entering high speed rail services will of course not come without a price. The routing and schedule proposed in our case study would require a minimum of five to six high speed trainsets at a total invest of around € 150m.

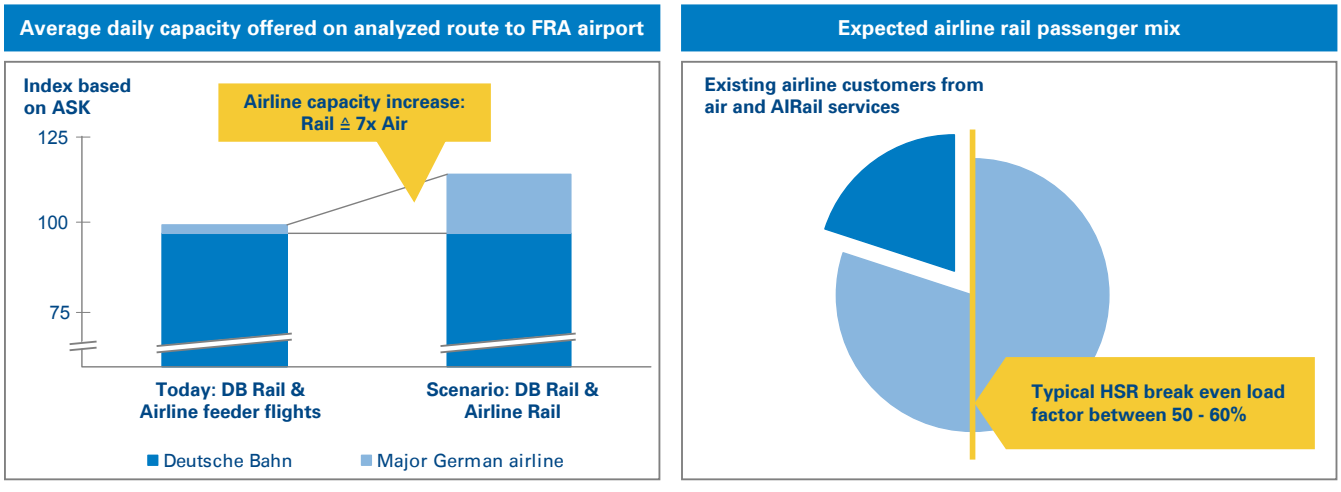
In terms of HSR operating costs, our analysis shows significant advantages on behalf of the incumbent Deutsche Bahn. These can largely be attributed to economies-of-scale effects, for example due to combined operation of two ICE3 trainsets. We believe that these cost advantages will initially account for 30-40% lower operating costs per available seat kilometre for Deutsche Bahn on dedicated high speed routes.

An airline's cost benchmark should however not only be the incumbent rail operator but also its current cost of operating short-haul feeder flights. We assess those to be more than 40% higher per ASK than with the evaluated airline high speed rail service.

We also believe that the major German airline considered would be able to generate higher yields per passenger than Deutsche Bahn due to its enhanced value proposition and the opportunity to fully leverage its yield-management expertise which becomes possible in a mandatory ticket reservation scheme.

The Arthur D. Little study of airlines moving into high speed rail shows that there are market opportunities and feasible business cases for such initiatives. We believe that Europe's incumbent rail operators will see their high speed rail operations challenged by new competitors in the oncoming years and some of these new players may well be network airlines moving into high speed rail as we have discussed in this paper.

Figure 2: Capacity analysis on train and air services via/ to Frankfurt airport



Source: Arthur D. Little Analysis, Analysis of Deutsche Bahn Schedule for the week 03.11.2008 to 09.11.2008, Analysis of feeder flight capacities of a major German airline on routes DUS – FRA, STR – FRA and AIRail passengers on routes CGN – FRA, Bonn – FRA, STR - FRA

An airline's way towards self-operated high speed rail services

Airlines considering replacement of feeder/ short-haul flights by self-operated HSR services need to make important strategic decisions in order to assess feasibility and derive a sustainable business model. We strongly believe that airlines should consider a joint venture approach. Finding the right rail partner and securing cooperative ties with other crucial stakeholders such as airport operators is one of the key issues to be addressed. Furthermore network strategy, product and brand positioning need to be defined and key issues of capacity, costs and yield need to be tackled in order to derive a sustainable business case.

How can Europe's railway incumbents answer the challenge?

Europe's railway giants do enjoy multiple opportunities to prepare for the challenges of (airline) competition. We have identified four main areas of action:

- Establish a truly European railway network and brand. The Railteam alliance initiative of major European railways is a first step, but more is to come in order to secure a level playing field when competing head-on with established airline brands
- Make yourself a crucial and non-substitutable partner in the aviation value chain. Secure feeder traffic through proactive cooperation with aviation players, for example by intensive code-sharing and the mutual recognition of airline loyalty schemes
- Improve your customer value proposition by innovative and customer focussed initiatives. These may be airline-style rolling stock concepts like the ÖBB Railjet but should also consider significant improvements in railway core-propositions such as punctuality, connectivity and ease of access
- Secure competitive cost-structures and efficient processes which are prerequisite in order to free resources needed to perform trough innovation and successfully face the challenges of new competitors in high speed rail operations

Arthur D. Little competence – Identify and leverage business opportunities in changing transportation markets

Arthur D. Little's vast consulting experience and expertise in rail, aviation and logistics as well as functional know-how in innovation, business strategy and operational excellence can help airlines, railways and airports to identify and leverage business opportunities in changing transportation markets.

We would very much enjoy the opportunity to discuss with you our insights into fundamentally changing rail and aviation markets and the challenges and opportunities arising for your company.

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Arthur D. Little

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