EXPERIENCES WITH AIR-RAIL PASSENGER INTERMODALITY –
THE CASE OF GERMANY

Intermodality Seminar
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EXPERIENCES WITH AIR-RAIL PASSENGER INTERMODALITY IN GERMANY

Agenda

1. Airports and the Railway Network in Germany
2. Rail Access at German Airports
3. Intermodal Services and Ticketing Options
4. Case Study Cologne - Frankfurt
5. Conclusions
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# Airports and the Railway Network in Germany

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Airport</th>
<th>Pax (m) 2008</th>
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<tr>
<td>1</td>
<td>Frankfurt</td>
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<tr>
<td>2</td>
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<td>3</td>
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<td>6</td>
<td>Cologne</td>
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<td>7</td>
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<td>Hannover</td>
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</tbody>
</table>
1. Airports and the Railway Network in Germany

The long-distance railway network between major metropolitan areas in Germany and neighbouring countries

- $V_{\text{max}} = 300 \text{ km/h}$
- $V_{\text{max}} = 250-280 \text{ km/h}$
- $V_{\text{max}} = <250 \text{ km/h}$
- Planned/Under Construction
1. Airports and the Railway Network in Germany

- Polycentric airport structure with two major hubs in Frankfurt and Munich

- Railway network resembles patchwork of high speed routes between a few cities, but also major routes with $V_{\text{max}} < 200 \text{ km/h}$

- Polycentric population structure requires many stops, resulting in increased journey times between major metropolitan areas

- Major projects currently planned/under construction:
  - Nuremberg-Erfurt – travel time reduction for Berlin-Munich from 6 to 4 hours (completion 2017)
  - „Stuttgart 21“ – new central station, airport long-distance station and high speed track to Munich – travel time reduction of 36 minutes for Stuttgart-Munich, Stuttgart-Stuttgart Airport 19 minutes travel time reduction (27 to 8 minutes)
  - „Riedbahn“ – new high speed connection between Frankfurt and Mannheim, including potential stop at Frankfurt airport (completion 2017)
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2. Rail Access at German Airports

An important prerequisite for offering intermodal products is rail infrastructure at airports and the integration into the train network.

Airports with long-distance train stations:

However, degree of integration into train schedules varies strongly:

<table>
<thead>
<tr>
<th>Airport</th>
<th>Daily frequencies, Regional trains</th>
<th>Daily frequencies, long distance trains</th>
<th>Total daily train frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frankfurt</td>
<td>215</td>
<td>143</td>
<td>358</td>
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<tr>
<td>Düsseldorf</td>
<td>235</td>
<td>46</td>
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<tr>
<td>Berlin-Schönefeld</td>
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<td>Cologne-Bonn</td>
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<td>Hamburg</td>
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<tr>
<td>Hanover</td>
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<td>40</td>
</tr>
<tr>
<td>Dresden</td>
<td>39</td>
<td>-</td>
<td>39</td>
</tr>
</tbody>
</table>

Source: German Aerospace Center (DLR), Air Transport and Airport Research Unit.
2. Rail Access at German Airports

Evaluation of rail access of German airports

- Frankfurt Airport as the largest airport in Germany is fully integrated into the long-distance train schedule of Deutsche Bahn
- At Düsseldorf Airport, Deutsche Bahn increases its frequencies again, after having reduced long-distance train stops almost to zero in recent years
- In Munich, a decision was made that no long-distance trains should be lead via the airport. A proposal to build a Maglev train with a direct connection to the city center/central station was rejected
- Cologne Airport received a brand new long-distance station including connection to the Cologne-Frankfurt line, but it is not well integrated in both the long-distance and regional schedule. Deutsche Bahn argues that travel time benefits for few passengers are outweighed by travel time disadvantages for a majority of passengers
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3. Intermodal Services and Ticketing Options (I)

Rail&Fly

- Basically a train ticket at a special price when booked in combination with an air ticket, sometimes already included in airfare
- Wide acceptance by both passengers and airlines/tour operators (82 airlines and 58 tour operators)
- Considerable potential in the low cost carrier market: 65,000 sold by HLX in the first half year after introduction
- “Soft Alliance“ – firm commitment, but low/no investments and sunk costs
- Low risk for airlines/tour operators and Deutsche Bahn
- No through baggage handling and no FFP mileage credit
- Focussed on PoS Germany, limited availability abroad
- Available since 1992
- Electronic ticketing available
3. Intermodal Services and Ticketing Options (II)

**Codesharing**
- Train services of DB receive flight numbers and can be booked via CRS or Internet
- Limited number of partner airlines: American Airlines, ANA, China Airlines, TAP Portugal
- Limited number of destinations - AA: 15, NH: 3, CI: 7, TP: 8
- FFP mileage accrual
- Through ticketing, but no through baggage handling
3. Intermodal Services and Ticketing Options (III)

AIRail
- Developed jointly by Deutsche Bahn, Lufthansa and Fraport
- Integrated ticketing, but not baggage handling any more -> partially seamless travel
- Available on two city pairs only: Cologne-Frankfurt Airport and Stuttgart-Frankfurt Airport
- Through baggage handling stopped in Oct. 2007, when LH stopped flying FRA-CGN
- Mileage Accrual in FFP
- About 30 air carriers use AIRail, among them many Non-Star-Alliance-Carriers
- approx. 170,000 passengers in 2005
3. Intermodal Services and Ticketing Options (IV)

Challenges associated with setting up AIRail:

Examples: Incompatible IT systems and different corporate cultures

Incompatible Reservation Systems!
3. Intermodal Services and Ticketing Options (V)

The higher the utility for passengers, the higher also the complexity of service provision:

<table>
<thead>
<tr>
<th>Utility</th>
<th>Complexity of service provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail&amp;Fly</td>
<td>AIRail</td>
</tr>
<tr>
<td>Codeshare</td>
<td></td>
</tr>
</tbody>
</table>

AIRail services do require high investments (e.g. baggage handling system), are associated with high operational costs

Business case?
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4. Case Study Cologne – Frankfurt (I)

The history of intermodality in Germany:

- Lufthansa Airport Express introduced on Frankfurt-Cologne-Düsseldorf in 1982
- Dedicated train for air passengers, four daily frequencies
- From 1990 additional route Frankfurt-Stuttgart
- Ceased operations in 1993 due to low frequencies (higher attractivity of regular trains), relatively high costs and unattractive travel times compared to air (GDS ranking)
4. Case Study Cologne – Frankfurt (II)

- New high speed railway line opened in 2002, reducing journey times between Frankfurt and Cologne from 2:15 hrs to 1:15 hrs
- Journey time Cologne Central Station – Frankfurt Airport: 1:00 hrs
- AirRail services inaugurated in May 2003
- Heavy investments into infrastructure at Frankfurt Airport – extension of baggage handling system to the new station
4. Case Study Cologne – Frankfurt (III)

Impacts on air transport demand and supply:

August 2002: Inauguration of new high-speed railway line between Cologne and Rhine-Main, travel time reduction from 2 hours to 1 hour
4. Case Study Cologne – Frankfurt (IV)

Effects beyond Cologne – OD-travellers on Düsseldorf-Frankfurt by air
4. Case Study Cologne – Frankfurt (V)

Initial reaction of Lufthansa after the inauguration of the high speed line:

- Frequency of air services reduced from 8 daily flights to 4
- Average aircraft size reduction from 116 to 80 seats
- Load factor down to 48% in 2006

Assessment of:

- Opportunity costs of slot use in Frankfurt
- Opportunity costs of aircraft/crew utilisation
- Competitive situation in Cologne

Finally, air services between Cologne and Frankfurt ceased in October 2007!
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5. Conclusions (I)

- In Germany, intermodal services are differentiated and are to a varying degree successful in the market.

- Several improvements could further encourage use of trains for airport access:
  - Door-to-door ticketing
  - Web-based meta-search engine, as air and rail remain separated today
  - Improved information provision for inbound travellers
  - New AIRail destinations (Düsseldorf/Nuremberg)
  - New high speed railway lines
5. Conclusions (II)

- Frankfurt is a good example for the benefit of intermodality: the integration of railway lines at the airport increases attractivity of location – the airport has developed into a multi-modal transport hub, which is also attractive as location for companies.
- The airport has increased its catchment area substantially.
- At least a few slots could be used for other flights (e.g. intercontinental flights) – this however actually increases total greenhouse gas emissions.
Thank you for your attention!

Time for questions and discussion.