

# Airline Network Development in Europe and its Implications on Airport Planning:

## Interview with Dr. Guillaume Burghouwt

Early 2005, Guillaume Burghouwt successfully defended his PhD-thesis at Utrecht University, the Netherlands, on the implications of airline network developments in Europe on airport planning. Guillaume provided us with a human interest side on the completion of this thesis in a recent interview.

By Willem-Jan Zondag

After obtaining his Master's degree in geography in 2000, Guillaume joined the Faculty of Geographical Sciences of Utrecht University as an associate professor and PhD-researcher in air transport and infrastructure planning. He decided to start his PhD, because he came to have a passion for the field of civil aviation and for air transport matters in particular, where a spatial or planning component was involved.

### What was the thesis generally about?

The PhD-research involved the analysis of airline network behavior in the deregulated EU aviation market, the impact of changing airline network behavior on airport connectivity and the strategic planning of airport capacity in volatile, deregulated markets. Guillaume has developed a special interest in connectivity indicators that measure airline and airport network performance, network concentration indices, volatility of airport traffic demand and the analysis of airport master planning processes. He analyzed, among other things, the possibilities for a more flexible airport planning to cope with an increasingly volatile and uncertain market environment.

### How was the four-year PhD-project structured?

Several phases can be distinguished in the process of completing the thesis. The first phase is what Guillaume calls the 'struggling phase'. In this phase, the PhD student has to think about formulating appropriate research questions and has to start writing the theoretical framework. Furthermore, other important decisions are what research methodology to use, and what other experts in the field to get in contact with. The second phase had a quantitative nature. It concerned analysis of relevant databases and the presentation of outcomes on conferences. The third phase was a 'human phase', as the aim was to carry out a qualitative analysis of airport planning by conducting many interviews at airports and airlines. The final phase was, what he called, the 'stress phase' and involved putting the finishing touch to the thesis. Every part of it had to be reviewed again and again and again. It was a tiresome phase, which consumed around sixteen hours a day and was therefore not the most attractive phase.

### What research questions did you come up with?

The thesis addresses questions like: to what extent have airlines reorganized



their route networks following the deregulation of the European air transport market? What have been the implications of the changes in airline networks on European airports? How can airport planning deal with increasingly dynamic airline network behavior and the related uncertainty concerning future airport traffic volumes? The thesis examines how airlines have responded to a changing regulatory environment and what this has meant in turn for airports and for airport planning in particular.

### What inspired you to come up with these questions?

The questions come from the aeropolitical environment. The deregulation of the US market especially has inspired Guillaume for this thesis. Guillaume tells that, during his studies, his idea for his thesis was triggered by the graphs that showed the

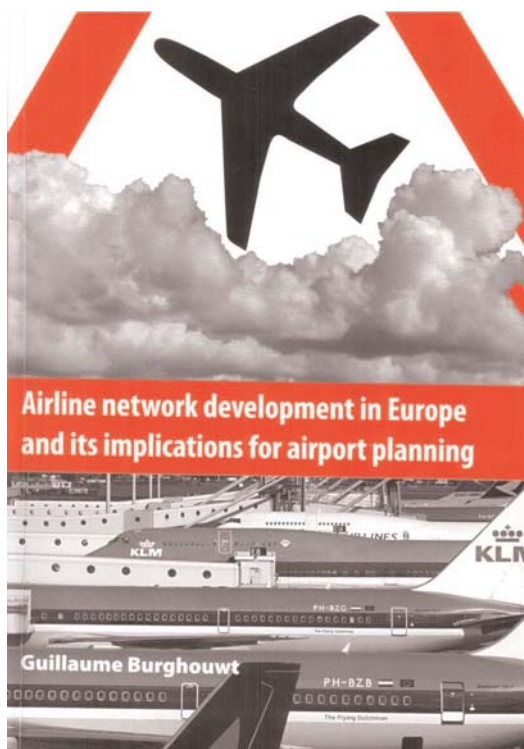
conversion among US trunk carriers of the point-to-point into a hub-and-spoke air network. Turning his attention to the European situation, he noticed that some experts said the hub-and-spoke system already existed in Europe as airlines concentrated their networks around the 'national' airports. However, a quantitative validation of this premise was lacking. Other triggers for Guillaume were several US studies that showed that the emergence of the hub-and-spoke system had created an inequality among airports that resulted in a few big airports (the hubs) and a majority of airports remaining small. Guillaume came to the conclusion that this was not really the case in Europe. The final trigger was the book 'Lessons Learned' by professor Dempsey in which he described the difficulties that Denver International Airport was facing due to deregulation.

### What can be expected of the future?

Due to the deregulation of aviation markets, airline network development has become much more flexible. Guillaume argues that the volatility of traffic volumes at airports may impede long-term planning of airport infrastructure. Guillaume expects an increase in wave systems at airports for the future of airline network development, especially at airports that face capacity shortages. At those airports (like London Heathrow), the hub operation has become bogged down by complexity costs that emerge from delays and large block times. In these cases, a peak block system appears to be suboptimal, and has urged airlines to distribute their waves evenly throughout the day instead. These measures will result in increased con-

nection times.

The second development that Guillaume expects to take place, is the convergence of hub-and-spoke systems and the low-cost airline business. Some low-cost carriers have a high point-to-point frequency, but operate with a central homebase while they



allow their passengers a transfer at their homebase. Prime examples are Frontier Airlines, based at Denver Airport, in the US that acts as a low-cost hub-and-spoke carrier, and Air Berlin from Europe, which has a hub on the isle of Palma in the Mediterranean. The third development is the increase of point-to-point connections as a consequence of the popularity of low-cost airlines and as a result of the growth in consumer demand, which make point-to-point connections increasingly feasible.

### Implications and Concluding Remarks

The thesis concludes that airports need to adopt a flexible approach to airport planning if they are to cope with an increasingly uncertain market environment. According to Guillaume, his thesis has contributed to the body of academic knowledge on airline network development in response to deregulation measures and on the hubbing and de-hubbing tendencies observed. But with regard to his third research topic on airport planning, Guillaume is convinced that further research is necessary, on the impact of traffic volatility on airport planning for instance.

An important implication of the dissertation for governmental bodies is that airports deserve a more flexible infrastructure policy. Governments should keep future growth at airports possible without (dis)approving this growth in advance. Land use and public works around the airports should not frustrate possible future growth. In many countries, such policies could conflict with ambitions of local municipalities around the airport.

### Contact Guillaume

After defending his PhD-thesis successfully in 2005, he joined the Amsterdam Aviation Economics research institute at the University of Amsterdam. See for more information the websites of AAE ([www.aaeconomics.com](http://www.aaeconomics.com)) and Airneth ([www.airneth.nl](http://www.airneth.nl)).

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