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Airneth research memorandum 07-2007

**The impact of EU-US Open Skies: the example of the Northwest route  
development at Heathrow**

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## **Introduction**

From 2008, the Open Aviation Area will be effective and one of the first major steps is the launch of direct flights by Northwest Airlines from Heathrow into its two hubs Detroit and Minneapolis.

Until now, Minneapolis had no direct connection from Heathrow. All passengers wanting to travel from Heathrow to Minneapolis had to connect at one of the intermediate hubs, such as Chicago, Toronto or even Amsterdam, the hub of the Sky Team partner of Northwest, KLM. The latter connection however involves a longer travel time, which reduces the expected market share of the connection via Amsterdam. The new flight between Heathrow and Minneapolis is expected to attract the majority of travelers in this market and hence, the share these hubs can expect is reduced significantly.

In contrast to Minneapolis, Detroit has been served directly from Heathrow for many years by British Airways. This airline could therefore attract most of the Heathrow-Detroit market. It could even serve this market at comfortable yields, as it dominated this market by the direct service, despite of the existence of the other indirect travel options that exist between Heathrow and Detroit. This dominance will come to an end with the new Northwest service, which not only reduces the market share of British Airways but also the yield of this airline in this market.

## **Impacts**

Interestingly, the expected effects on the markets between Heathrow and these two cities are not the most important ones. Detroit and Minneapolis have – relative to other USA-destinations – limited market potentials. These (origin-destination) market potentials are by far not sufficient to justify the launch of the two Northwest flights.

Most of the potential that is expected on these flights is to come from the markets beyond these two hubs. Northwest has a dense network within the USA and these new flights will increase the connectivity between London and many US destinations beyond Detroit and Minneapolis significantly. One of the impacts is the generation of 48 new destinations from Heathrow (of which 5 in Canada) with a ‘single transfer’ service. This increased connectivity is not only seen in these new markets, but also to a more limited extent in the markets already

served by the competing airlines. Overall, *generalized travel costs* are reduced and hence, a total market generation effect can be expected: 4% additional travelers from Heathrow to the USA and 0,5% to Canada.

The implications for Northwest Airlines are substantial. It is likely that the carrier will get the lion's share of the traffic on these newly created markets. In addition, by starting the Minneapolis/Detroit services, Northwest will also divert some traffic away from other 'beyond markets', in particular those of the STAR-alliance beyond Washington Dulles and Chicago as well as of the oneWorld alliance beyond Dallas and Chicago. It is recognized that – particularly from Heathrow – there are many daily flights to the North American continent. Most of the passengers to the larger destinations are traveling on these direct flights, leaving in principle little potential for indirect services to this continent via hubs. On the other hand, despite of these direct services, there are still many destinations not served directly. Their market size may be small, but their number is large and moreover these hubs have the full share in these markets. Taking the indirect services of the other two alliances into consideration, we expect that Northwest will have little difficulty to reach break-even load factors. Several factors contribute to expectations about the Northwest market share, which are all addressed below.

## **Factors contributing to the expected Northwest market share**

It is assumed that Heathrow will get a daily flight to both the hubs Detroit and Minneapolis. This frequency level is low, considering the frequency of competing airlines to the USA from London. The STAR-alliance (by United) has 4 daily flights to<sup>1</sup> Washington and 3 to Chicago. oneWorld (by British Airways and American) has even 8 daily flights to Chicago and 1 to Dallas. The share of SkyTeam in the number of direct travel options between Heathrow and the USA (only considering the services to these hubs) is therefore only 11%. Nevertheless, by these two daily flights only, it may be able to realize 22% of all daily *effective indirect travel options* to final destinations in the North American continent. This is a significant difference, which can however be partly attributed to the fact that Northwest Airlines has 48 unique destinations, which contributes to this difference. The table below summarizes the indicators described from Heathrow via these hubs to any final destination in the USA (and Canada /Mexico).

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<sup>1</sup> OAG, September 2007

## Direct and indirect travel options

	Sky Team		STAR		oneWorld		Total	Share of SkyTm
	DTW	MSP	IAD	ORD	ORD	DFW		
Direct travel options								
from LHR to hub	1	1	4	3	8	1	18	11%
from hub to destination	485	435	300	568	411	577	2777	17%
Indirect travel options								
from LHR to destination	95	90	149	192	250	83	6014	22%

There is a straightforward relationship between frequency share and market share. Assuming a linear relationship, the SkyTeam-alliance (in this case Northwest Airlines) may also expect similar market shares (taking into consideration the weights resulting from differences in market size) in the connecting market<sup>2</sup> between Heathrow and the North American continent. However, this relationship is not linear, but takes the well-known S-curve form. A lower than average frequency share results in an even lower market share. Based on this S-curve, and the lower than average frequency share the two SkyTeam hubs have, one may expect a lower market share of the two SkyTeam hubs Detroit and Minneapolis.

Yet, it is not only frequency that counts. Generalized travel costs include also travel time, which may differ significantly between the hubs. Considering an indirect connection between Heathrow and – say – Seattle, there is a circuitry time involved when connecting at one of these hubs. This is the difference between the total flight time and the great circle flight time. Considering this circuitry only, Minneapolis has the shortest circuitry, 4 hours and 50 minutes. Next best options are Chicago (6 hours), Detroit (6 hours and 10 minutes) and Washington (7 hours and 30 minutes). No viable connections from London to Seattle via Dallas are offered, as the total elapsed flight time is considered as too long.

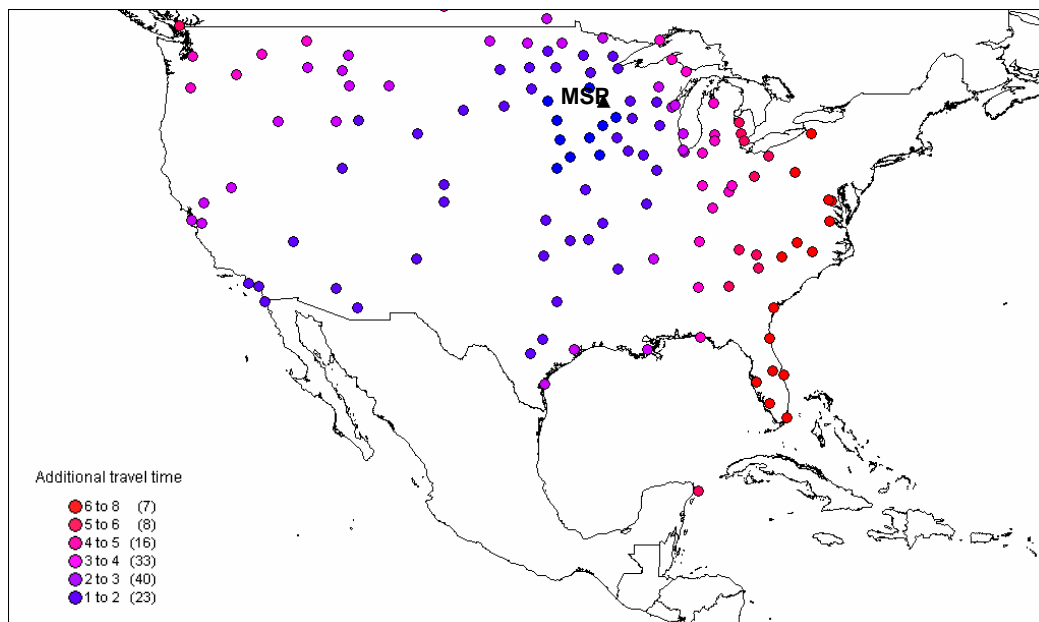
This results in an additional competitive advantage of connecting at Minneapolis vis-à-vis Washington of 2 hours and 40 minutes, which difference can be expressed in *generalized travel costs*. Assuming an average travel time value of €35 per hour, this would result in a competitive advantage of the Minneapolis hub vis-à-vis the Washington hub of an order of magnitude of €90 per single journey.

<sup>2</sup> We define the connecting market as the number of passengers connecting at the six USA-hubs specified. We ignore therefore the passengers connecting at European hubs.

Such advantages for the two SkyTeam hubs exist to the final destinations located on the west coast. However, these advantages fade away as final destinations are located more to the east. For final destinations at the east coast, Washington is obviously the best hub, although Dallas comes in when destinations in the south are considered. Taking all final destinations together, there results a small competitive advantage of geographical location of the to SkyTeam hubs vis-à-vis the other four competing hub systems.

The map below and the maps in the Appendix illustrate the travel time advantages to various viable final destinations in the US, Canada and Mexico via the five aforementioned hubs.

*Additional travel time (hrs) from London Heathrow to final destinations via Minneapolis St. Paul (MSP) in comparison with a (hypothetical) direct flight (only viable connections are shown)*



Although the two SkyTeam hubs have a lower than average share in frequency, which suppresses the expected market share, there is the positive effect of the (however small) geographical advantage. As the geographical effects are small, the overall resulting effects are dominated by the differences in frequency share. After taking into consideration the composition effects of the market size of each of the final destinations, one may after all estimate the expected market share of each of the hub systems. This results in an expected

market share of the two Northwest flights in the connecting markets of 20%. The effects described above are summarized in the table below.

	SkyTeam DTW - MSP	STAR IAD - ORD	One World ORD – DFW
Indirect travel options from LHR to final destination	22%	40%	39%
Effect of frequency share on market share (S-curve)	-	+	-
Advantage of geographical location of hubs	+	-	+
Expected market share	20%	44%	36%

## Airfares

In determining these market shares, implicit assumptions have been made on the airfares each of the airlines is charging. Obviously, these assumptions are to a large extent determining the expected market share. In the assessment made here, ‘expected airfares’ are estimated. These depend firstly on the great circle distance between Heathrow and the final destination (increasing expected fares with increasing distance). Generally, on indirect connections discounts are applied, despite of the longer distance flown, which discounts have been taken into consideration. The most discerning effects between the distinct hub systems come however from the competition level on the markets, the airlines operate in. It appears that of all three alliances operating in the indirect market from Heathrow, the SkyTeam alliance operates in markets with relatively the lowest competition level. The 48 new markets that are generated have the lowest (if not zero) competition level as SkyTeam is obviously the most dominant. Hence, the expected airfares and airline yields are relatively high in these markets. Also in other markets, despite of the low overall frequency share, there are several specific markets with a relatively high dominance of SkyTeam with inherent high airfares. Only in markets with high competition level, the expected airfares are lower.

Taking all these effects together, the average competition level in the market via the SkyTeam hubs is 0.38<sup>3</sup>, being lower than similar levels in the markets of the other airlines. This implies that on average SkyTeam may set a premium on its airfares, which premium depends on the actual competition level in a specific market. All these effects on airfares have been taken into consideration in this assessment, which have resulted in the market shares shown.

<sup>3</sup> This is an index derived from the Herfindahl-Hirschman Index (HHI), being an index of concentration. If HHI=1, there is a monopoly and if HHI approaches zero, this assumes minimal concentration and full competition. The competition index is therefore defined as (1-HHI).



Despite of the higher fares assumed to be charged by the SkyTeam alliance, the expected revenue share is still 20%, practically equal to the market share. This suggests · in contrast to the statements made above· that the yields of SkyTeam are equal to the average in these markets.

However, there is an underlying composition effect here. The average great circle distance from London in the markets dominated by SkyTeam is relatively short: about 30 minutes shorter than via the other hubs. This amounts for €20 lower airfares, which compensates the effect of the relatively high yield in these markets. The effects described are summarized in the table below.

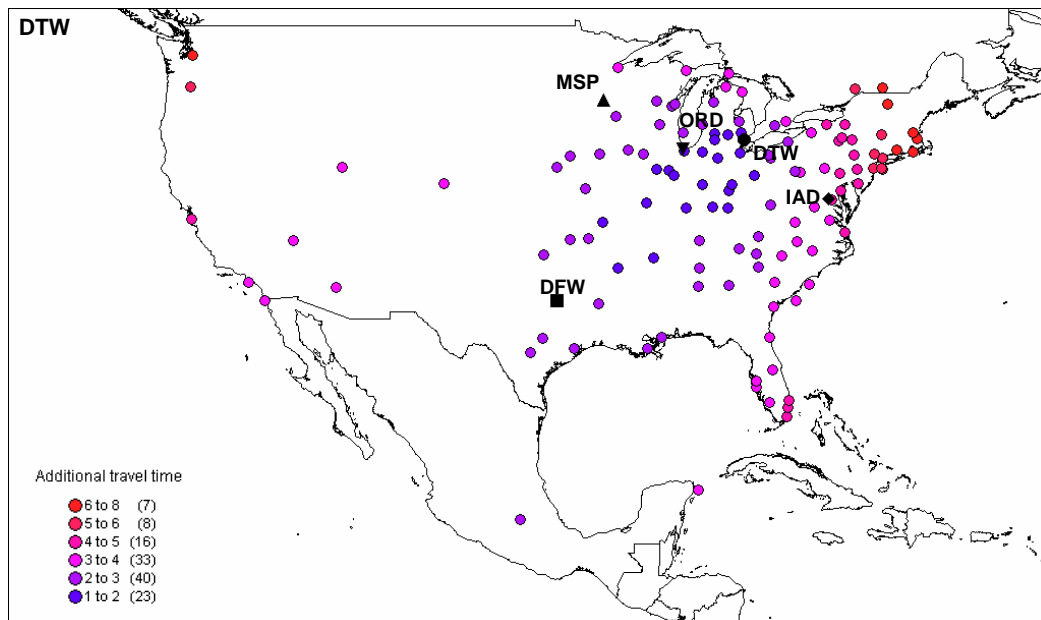
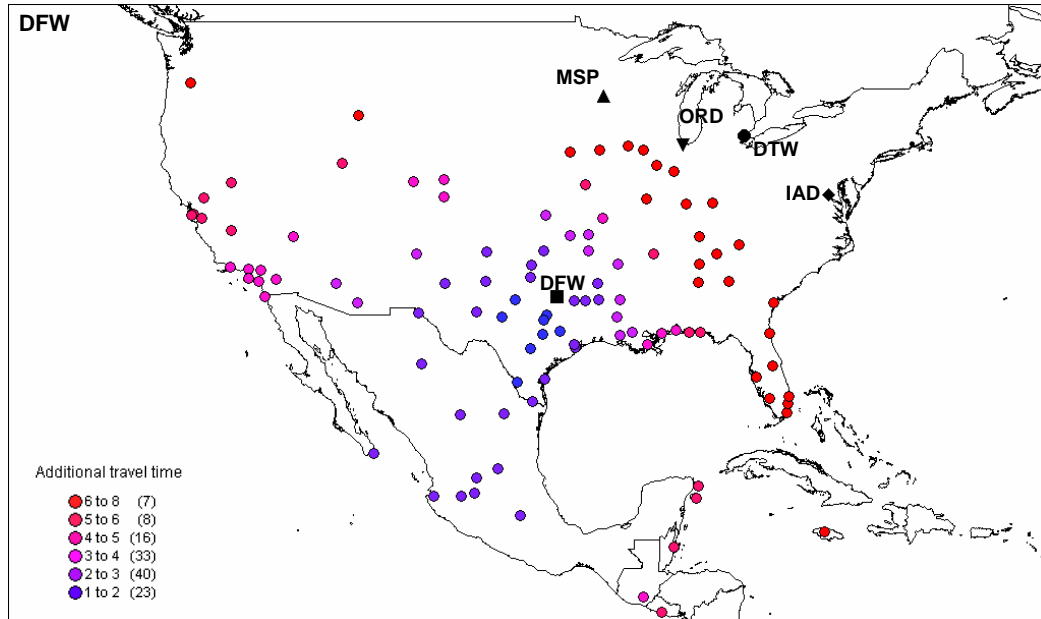
	SkyTeam DTW - MSP	STAR IAD - ORD	One World ORD – DFW
Expected market share	20%	44%	36%
Average competition level	0.38	0.48	0.41
Expected revenue share	20%	42%	38%

## Conclusions

With 11% of direct flights from Heathrow, SkyTeam is able to take 20% of the market share, despite of the higher fares charged due to the described dominance. This market share is likely to exceed the capacity offered on the route. If Northwest keeps operating two daily flights it needs to turn off passengers, which it may naturally do by setting additional premiums on its fares. This would bring back the market share to levels according its capacity share (being 11% or little higher if the largest possible aircraft is used, in 2008 still the B747). The premium would however generate significant additional revenues, making this new operation very likely to a success.

## Appendix

*Additional travel time (hrs) from London Heathrow to final destinations via Dallas-Ft. Worth (DFW) (above) and Detroit (DTW) (below) in comparison with a (hypothetical) direct flight (only viable connections are shown)*



*Additional travel time (hrs) from London Heathrow to final destinations via Washinton Dulles (IAD) (above) and Chicago O'Hare (ORD) (below) in comparison with a (hypothetical) direct flight (only viable connections are shown)*

