

Lessons from the failure of Connexion-by-Boeing

Over the last 18 months, TMF Associates has questioned the potential of the Connexion-by-Boeing service to offer either a return on Boeing's \$1B plus investment or a reasonable timescale for breaking even, in the face of the near unanimous acclaim for Connexion offered by other analysts and consultants. For example, Connexion was named by IDC wireless services analysts as one of the "Wireless Companies to Watch" in 2005 and as recently as April 2006, Northern Sky Research (NSR) acclaimed the "commercial success" of Connexion and stated that Connexion's "unique solution is proof that the value proposition of 'on-the-move' broadband services is truly compelling"¹. In contrast, in March 2005, we estimated that it could take "another four years before profitability is achieved" and questioned whether Boeing would wait this long², while in June 2006 we predicted that "Connexion's commercial service will ultimately be closed down, probably at the end of this year"³.

Now that Boeing has finally admitted that the "market for the service has not developed satisfactorily" and decided to shut down Connexion, we believe that the time has come to examine the lessons of the Connexion debacle for airlines, passengers, and most of all, for other systems planning to offer in-flight passenger communications in the future.

Previous passenger communications services have always failed to achieve critical mass, and develop a virtuous circle of higher usage, leading to a positive financial return for the airline and increased deployment. This can allow economies of scale and reduced prices to be realized, which can further stimulate usage. The key factors in achieving such momentum are that the service is cheap enough to meet users' expectations (which are set by terrestrial services) and easy enough to use that a high proportion of passengers fall into the addressable market. While Connexion's Internet access service was relatively easy to use, its addressable market was limited to passengers who wanted to use a

¹ See <http://www.nsr.com/AboutUs/PressRoom.html>

² See <http://www.tmfassociates.com/Connexion.pdf>

³ See <http://www.tmfassociates.com/Connexion2006.pdf>

laptop onboard, and the pricing (\$26.95 per flight for unlimited usage) was significantly higher than terrestrial services.

As a result, the revenue per equipped aircraft was far lower than the \$500,000 per year that Boeing had predicted⁴, and in the end we estimate the service only generated around \$100,000 per plane per year, from an average of 10 users per flight. This had two consequences. Firstly, Boeing needed to sign up too many aircraft in order to break even, delaying the point at which a return on its investment could be generated; and secondly, airlines had to subsidize the (very substantial) cost of equipment purchase and fuel required to transport it, since they could not recover these costs from the share of end user revenues they received. As a result, relatively few airlines were willing to commit to the Connexion service. Even if Boeing could have provided service in the short haul market (which it was prevented from doing by the very large Connexion antenna), cost sensitive short haul carriers would have been unable to justify the investment required to provide the service.

What are the implications for other providers of in-flight connectivity services? In our view the most critical lesson is that, if rapid deployment is to be achieved, then airlines need to be able to make enough of a financial return from their revenue share at least to cover the cost of the equipment and fuel to transport it, and preferably to make a significant profit. Only then will low cost carriers be willing to deploy these services and service providers be able to reach breakeven in a reasonable period of time.

There are two quite different approaches being taken to provision of new in-flight connectivity services. Firstly, OnAir (backed by SITA and Airbus) and AeroMobile (backed by ARINC and Telenor) plan to deploy in-flight cellular roaming services using Inmarsat satellite equipment for backhaul. According to OnAir, calls will start at around \$2.30 to \$2.50 per minute, declining to around \$1.50 at the end of five years. Data services such as SMS (priced at around \$0.60 per outgoing message) and GPRS for PDAs and Blackberries will also be supported. While OnAir is focused on the short haul European market in the near term, AeroMobile has concentrated more on long haul services, particularly in the Middle East and Asia.

⁴ See http://www.forbes.com/technology/networks/2004/06/17/cz_gh_0617wifi.html

The second type of service is planned by AirCell in the US, using Air-To-Ground (ATG) spectrum recently auctioned by the FCC. AirCell (which is a small company backed by Ripplewood Holdings) plans to provide WiFi laptop connectivity on domestic US flights, similar to the Connexion service, although at much lower cost (projected to be less than \$10 per flight). Though AirCell could also support cellular roaming, it will take some time before the FCC rules on whether use of cellphones will be permitted in the US, due to objections raised by cellular operators about potential interference to their terrestrial networks, and claims by the cellular operators that their rights to cellular frequencies also prevent any in-flight use of these frequencies by third parties.

A key difference between the services proposed by OnAir and AirCell is in the cost and weight of onboard equipment. The cellular roaming equipment used by OnAir and AeroMobile is expected to weigh less than 50kg and will cost roughly \$200,000 to install on a plane that already has an Inmarsat satellite antenna (such as most long haul aircraft), but as much as \$350,000 on a plane that does not currently have an Inmarsat installation (including almost all short haul aircraft). The ATG equipment used by AirCell is expected to weigh less than 25kg and cost up to \$100,000 per plane to install.

Another difference is the revenue share likely to be available to the airline. In-flight cellular roaming costs will be billed through the customer's home cellular operator, on their regular monthly bill. As a result the cellular operator will apply a significant markup to the wholesale price for all users. While Internet access services may be billed through WiFi roaming services in some circumstances, other customers will be charged direct to their credit card. This will potentially allow airlines to receive a higher share of end user revenues from the AirCell service.

When both factors are taken into account, OnAir and AeroMobile will need much higher end user revenues per equipped aircraft than Connexion's \$100,000 per aircraft for airlines to breakeven on the cost of providing the service. While AeroMobile acknowledges that it is targeting airlines who are willing to make an investment in a differentiated service (one reason for its focus on the long haul market), OnAir has recently signed a large deal to equip Ryanair's entire fleet of over 200 aircraft. Ryanair are explicitly seeking to make a significant profit from in-flight calling and as our analysis shows, this may be a challenging objective. On the other hand, airlines will be able to break even on the cost of deploying AirCell's equipment at even lower levels of revenue per equipped aircraft than that achieved by Connexion. This is likely to make the AirCell service rather more attractive to cost sensitive airlines in the US market.

The level of revenues that will accrue to providers of in-flight connectivity services remains uncertain, because the rate of deployment will depend critically on the levels of usage achieved by the first airlines to offer the service. If rapid deployment takes place, then in-flight connectivity services could generate almost \$1B per year by 2016. However, if deployment is held back by insufficient usage, then total revenues may be less than \$300M per year.

What is certain, however, is that projections made by many consultants and service providers that in-flight connectivity will be a multi-billion dollar market within the next few years, are wildly exaggerated. For example, Booz Allen estimated in July 2006 that the in-flight cellular roaming market in Europe alone would be EUR 2B by 2010⁵, while in July 2005 Frost and Sullivan projected a \$3.5B worldwide market size for in-flight connectivity by 2010⁶. Boeing also put forward very ambitious targets, estimating that Connexion would have revenues of \$2.5B to \$3B in 2010 from 4,500-5,000 aircraft⁷.

These forecasts are clearly unrealistic when compared with total spending by business travelers on other communications services. For example, Booz Allen's forecast would require in-flight cellular roaming to account for over 40% of the total intra-European international cellular roaming market, (which the GSM Association recently estimated at a retail value of EUR 4.6B in 2005⁸), including both business and leisure travelers, when the average time spent on a plane during intra-European business trips is only a few percent of the total working hours during the trip.

Given this over-optimism, we believe it is critical that a realistic view of the future market size is conveyed to the press and general public. While it is important for service providers to raise awareness in order to stimulate usage of these new services, if the public are encouraged to believe that in-flight connectivity will soon become a multi-billion dollar business and will be ubiquitously available when flying, this simply sets the stage for future disappointments. We have already seen that a misunderstanding of the frequency of cellphone calls has led to a completely unnecessary

⁵ See <http://www.ameinfo.com/92876.html>

⁶ See <http://www.aircell.com/about/presentations/AIX-04.2006.pdf>

⁷ See http://www.chicagobusiness.com/cgi-bin/news.pl?post_date=2004-03-25&id=11898&rel=1

⁸ See http://www.gsmworld.com/documents/review_commission_impact.pdf at p14

backlash against the introduction of in-flight cellular roaming, because passengers think they will be constantly disturbed by their neighbors talking on the phone. The combination of Connexion's failure and the continued over-optimism of some analysts now has the potential to create a mistrust of in-flight connectivity business plans amongst both airlines and the investment community, which would set back the prospects for in-flight connectivity immeasurably.

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