

## **The 50-Seat Jet: A Plane With No Future. Think again!**

Manufacturers are shutting down production of 50-seat jets in the face of empty order books and changing economics. What are the options for operators with low-volume routes to serve and aging fleets to replace? A solution is necessary, and the industry must work together to find it.

The low-density, sub 1,000 mile (1,600 km) market, profitably built upon the capabilities and economics of the 50-seat jet, faces a crisis. Once the great competitive hope of the regional airline industry, 50-seat jets are now becoming a liability that the industry as a whole needs to address to move forward. All the obvious stakeholders in this issue – OEMs looking to provide other options, regional airlines serving routes up to 1,000 miles, and major airlines tied to these regionals by capacity purchase agreements (CPAs)—will face the consequences of an aging fleet with no obvious replacement. Ripples from this crisis will also extend through the financiers, lessors, and insurers behind these players. The market remains viable, the issues are immediate, and the current solutions are, at best, imperfect.

### In the Beginning: Explosive Growth

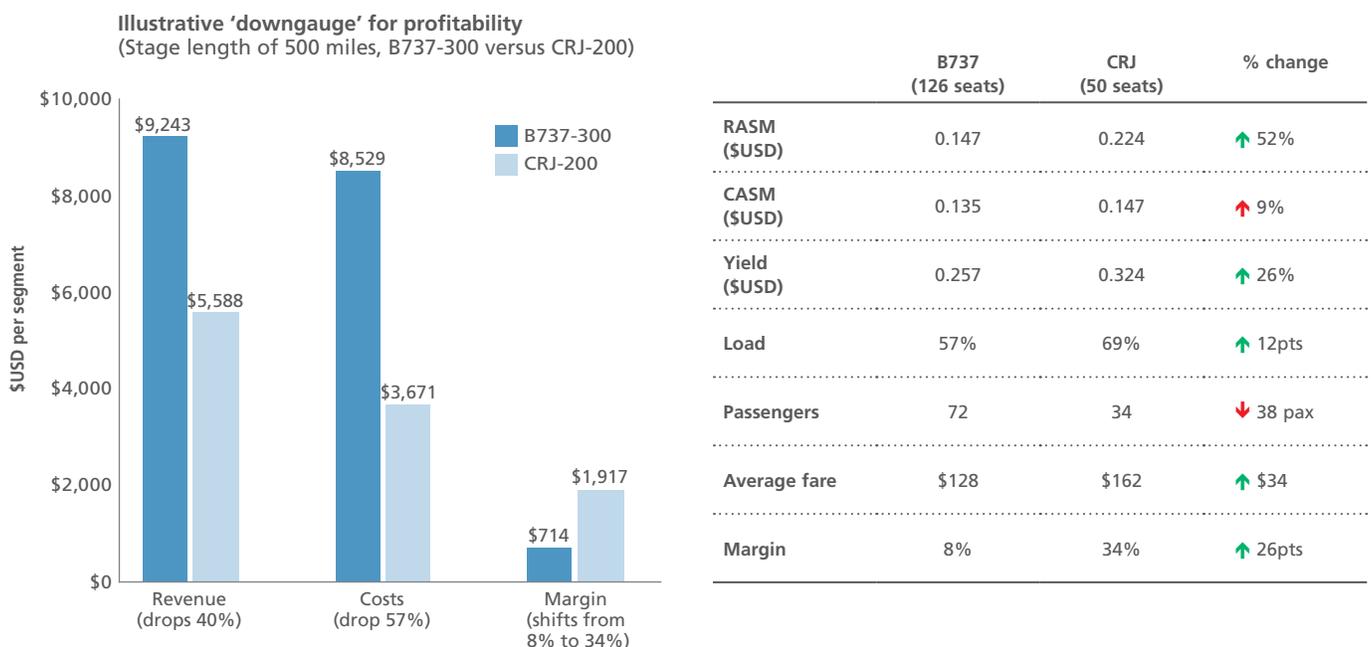
The economic benefits of the 50-seat aircraft helped to establish the regional airline industry, as it exists today. With their attractive labor and overhead cost structures and higher unit revenues, regional airlines flying 50-seat aircraft flourished and profitably filled the gap that mainlines could not. On an absolute basis, these smaller jets had lower fuel

consumption and lower pilot costs. Relative to the mainlines flying a larger aircraft on the same route, a regional airline flying a 50-seater could achieve higher revenue per available seat mile and feed the rest of the network. The long-term, fixed-fee contracts (capacity purchase agreements, or CPAs) that the regional airlines signed with the mainlines afforded them margin protection while eliminating revenue risk, and provided them the ability to concentrate on rationalizing cost.

50-seat regional jets were first introduced to the aviation market in 1995 by Bombardier in the form of its CRJ-200 jet. Designed to offer the high-speed advantages of a jet, it had trip cost economics similar to turboprops and was ideal for flying stage lengths up to 1,000 statute miles. Embraer soon followed with the ERJ-145 regional jet first delivered in December, 1996. Flown by regional airlines such as SkyWest, Pinnacle Airlines, and ExpressJet on behalf of mainlines such as Delta Northwest, Continental, and United Airlines, the popularity of these aircraft quickly took off because of customer preference for jets over turboprops and because they allowed airlines to profitably fly routes that larger jets could not.

### Exhibit 1 Boomtime regional economics

Originally, regional jets created superior economics in ‘thin’ markets by focusing on high-yield customers



Source: 2003Q3 data from DOT Databases T100 and DB1B; Oliver Wyman analysis.  
Stage lengths from 400-600 miles, Downgauge route identified as 737 route with load factors <65%, average fare in bottom 2 quartiles.

Need and opportunity aligned with economics and North America experienced an upsurge in the popularity of regional, 50-seat jets in the mid-1990s. They saw particular success on routes where historically the numbers of profitable business passengers were few and many of the seats were filled at low fares with a proportionally high number of leisure travelers. Unable to profitably fill expensive planes, mainlines saw the 50-seat regional jet as an offering that provided the perfect 'gap filler.' Designed to fly shorter stage lengths with fewer passengers, the regional jet's ability to skim the high-yield travelers more than offset its higher unit operating costs. Analysis has shown, for example, that a 'down-gauge' from a B737-300 to a CRJ-200 for a 500-mile stage length could drive margins from 8% on the larger aircraft up to 34% on the smaller, regional jet.

As a result, beginning in 1998 regional airlines consistently outperformed their mainline partners in annual profitability: With their margin protection, the regional airline segment's EBIT margins never fell below 7%. The number of regional jets in service grew 48% annually in this period; of the regional jet deployments, 26% replaced mainline flying, and 36% represented new routes.

### **The 50-Seater Falls Out of Favor**

Ironically, the same levers that had previously given the smaller jets superior economics in thin markets began to contribute to the decreasing attractiveness of 50-seat flying post-9/11. Three factors have contributed to the steepness of the current decline: the current recession, the comparatively poor economics of these jets, and the willingness of the airlines to experiment with alternatives.

- **Recession:** Although 50-seat jet deliveries have been declining at an average annual rate of more than 40% since 2001, the recession has further depressed the outlook for the regional jet industry in general. The same macroeconomic dynamics which turned against 50-seaters in the post-9/11 recession are back with a vengeance. With no orders for Bombardier's regional jets so far this year, it is uncertain when demand will

pick up again. Both Embraer and Bombardier have made headlines as they responded to low demand and order cancellations in early 2009 with 15-20% labor cuts.

- **Operating Costs:** Another reason for declining supply is the comparatively poor economics of 50-seat jets compared to larger jets. Oliver Wyman's analysis of five major US regional airlines found that 50-seat jets cost 10% more per available seat mile than 70-seat jets in comparable age profiles. Volatile fuel prices add to the economic challenge because 50-seaters have higher relative fuel consumption compared to larger jets. Furthermore, fixed operating costs for a 50-seat jet, such as dispatch, flight planning, navigation, and pilot costs must be distributed over fewer seats, making these smaller jets inherently more expensive to fly. Indeed, as the mainlines entered and emerged from bankruptcy, mainline pilot wages dropped, thus shrinking the difference between mainline and regional cost per available seat mile (CASM).

Additionally, Oliver Wyman analysis has found that the operating costs for a 50-seat jet rise disproportionately as the aircraft ages. Thus while regional airlines currently have substantially younger fleets than mainline carriers, and therefore enjoy a natural cost benefit, the added costs of aging jets will pose a dilemma for airlines locked into long-term capacity purchase agreements or leases (some as long as 20 years).

- **Alternative Substitutes:** The 50-seat jet market has been further depressed as regional airlines experiment with substitutes. This trend can be seen in the popularity of high-performance turboprops. Firm orders for the technologically advanced 74-seat Q400 stand at 355, and 245 had been delivered as of April 30, 2009, according to Bombardier. Continental for example announced last year that it would replace 15 ERJ-145 jets with Q400 turboprops to service flights within 500 miles of Newark Liberty airport. Malév Hungarian Airlines also plans to phase out its CRJ-200s in favor of Q400s.

Taken together, the response by airlines and manufacturers have only accelerated the decline of the 50-seater. Deliveries of new 50-seat jet aircraft hit their high mark in the first half of this decade and the battle has been uphill ever since, as demand has steadily shifted toward larger regional jets (e.g., CRJ-900 or E-190), turboprops, or other alternatives such as a downgauged larger jet (e.g., the CRJ-705). Bombardier and Embraer, which hold the majority of the market, have seen average annual deliveries in 50-seat aircraft plummet by 40-70% over the past few years.

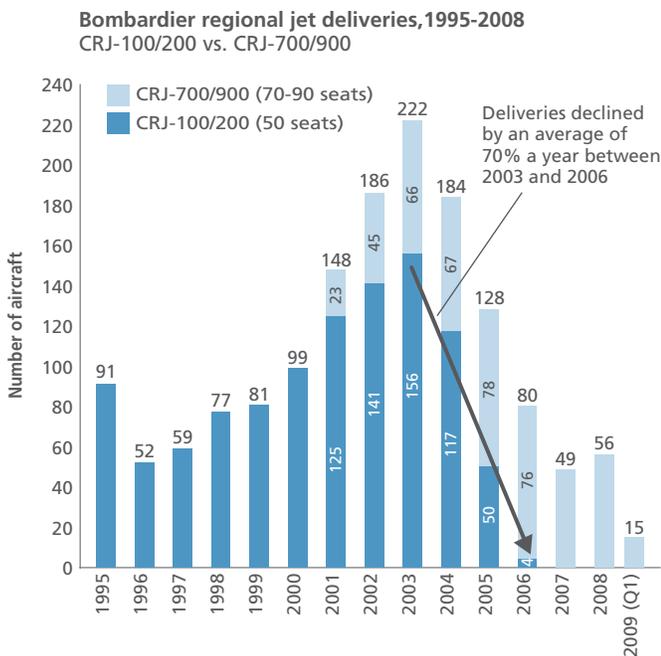
Neither *Airline Monitor* nor the manufacturers expect a return to pre-2001 production levels, when worldwide 50-seat jet deliveries peaked. Mauro Kern, Executive Vice President of Embraer's Airline Markets, stated in the company's 2009 forecast that the manufacturer had "seen the maturity of the 50-seat market." Additionally, Mitsubishi Aircraft Corporation and Russian aircraft manufacturer Sukhoi have no plans to introduce a 50-seat model.

### Future Demand: Gone for Good or Just Latent?

Looking ahead, the bleak future of 50-seat jets poses a problem for operators with low-volume routes and aging 50-seat jet fleets. Despite manufacturers eliminating 50-seat jets at present, the reality is that the regional industry will still need such a jet – or at least a viable alternative – to replace their 50-seat fleets as they age. Although the industry is biased against 50-seat jets today, regionals, manufacturers, and mainlines must collaborate and find an agreeable alternative.

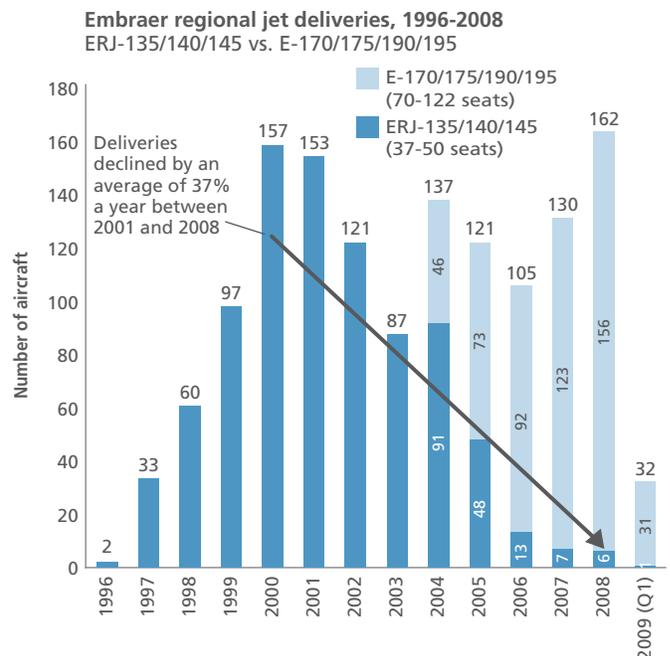
How immediate is the problem? The oldest 50-seat jets are only 12-13 years old, and there are differing perceptions on the total lifespan of these aircraft, though the consensus seems to be that aircraft not much older than this will be either ready for replacement or due for a major structural refurbishment soon. Specifically, Oliver Wyman estimates that more than 25% of the current 50-seat jet fleet (more than 2,000 jets) - including all CRJ-100/200 and ERJ-135/140/145 aircraft - will become eligible for replacement between now and 2014.

Exhibit 2a **Bombardier RJ deliveries**



Source: Commercial Airline Monitor (July 2008), Bombardier Program Status Reports.

Exhibit 2b **Embraer RJ deliveries**



Source: Commercial Airline Monitor (July 2008), Embraer press releases.

As an example of the impact on both regional and mainline airlines, Republic Airways has a long-term CPA with Delta to operate ERJ-145s that are currently 6 years old, on average. When the CPA expires in 2016, the aircraft age will be nearing 15 years and operating costs are likely to soar. The industry may not be ready for this imminent need, so it will be crucial for manufacturers to work with regionals and mainlines to approach the 50-seater problem.

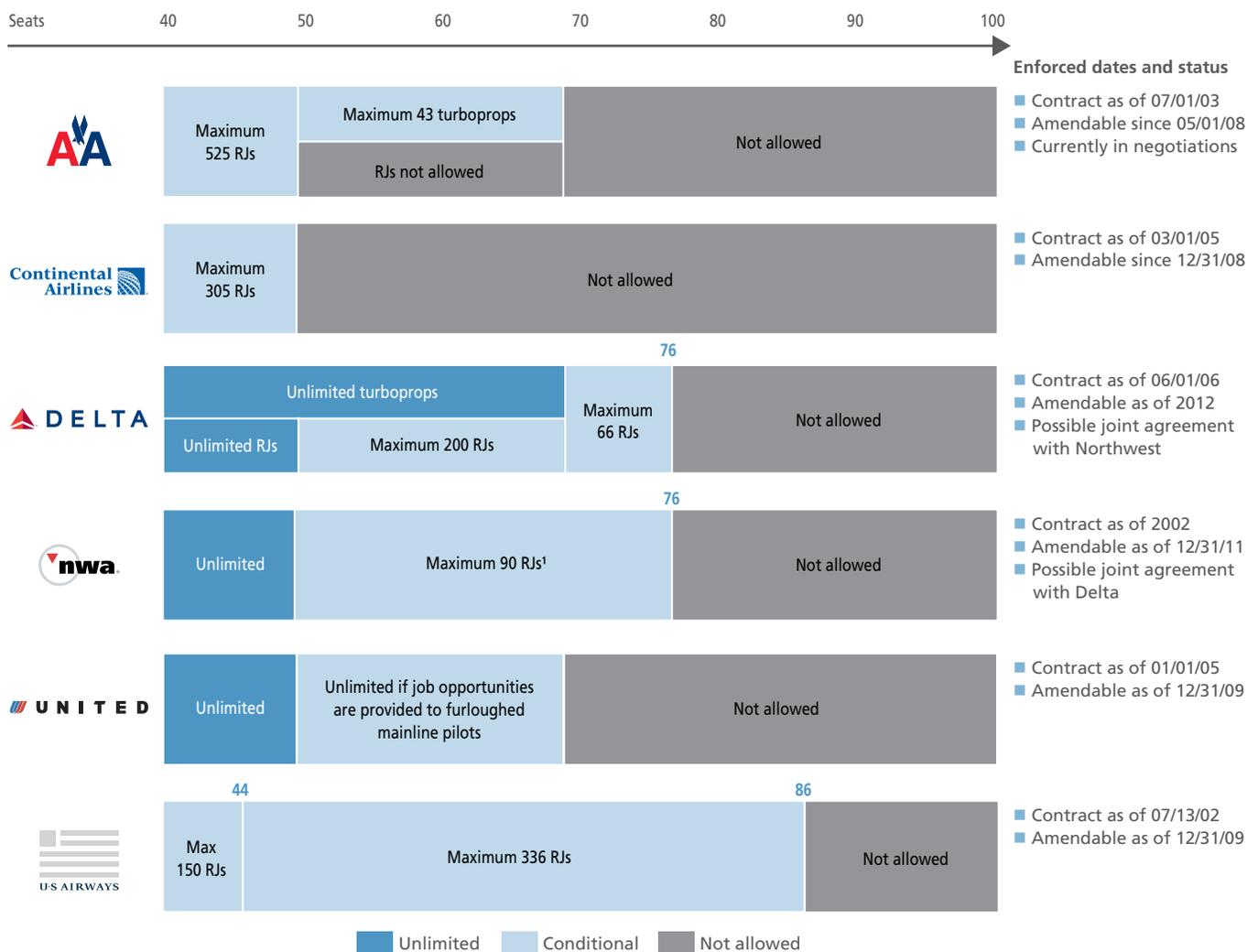
### A Host of Imperfect Solutions

There is a range of options to address the impending demand for 50-seat jets, despite

a present lack of supply and low economic desirability – some more viable than others. Why not simply replace 50-seat jets on routes not suited for turboprops with larger jets, for example? Unfortunately, scope clause restrictions included in labor contracts for airline pilots make this difficult to impossible for many major airlines. Currently, American, Continental, Delta, Northwest, and US Airways have set limitations on the number of regional jets they can fly with more than 50 seats. Delta and Northwest appear to be among the few airlines flying fewer than this maximum limitation, according to Oliver Wyman analysis.

### Exhibit 3 Scope clauses — Aircraft / seat restrictions

Aircraft restrictions based on agreement structures and actual mainline / regional fleet composition in May 2009



Source: Latest scope clause agreements, Oliver Wyman analysis.

<sup>1</sup> 51-76 seat regional jets may be certified for up to 90-seats, but must be configured for less than or equal to 76 seats to fly with NWA.

Therefore, replacing 50-seat jets with larger jets does not appear to be a viable solution in the short-term, given these tight scope clause restrictions and the low likelihood of a near-term relief.

A short list of other solutions in order from least to most likely includes:

**Continuing 50-seat jet production:** When demand for the 50-seat segment picks up in the near future, Bombardier and Embraer could revive production, e.g., by converting their business jet production facilities back to commercial jet production. Operators may be reluctant to embrace this option, however, given the poor economics of operating 50-seat jets as they are, while manufacturers may not warm to ramping up production that could cannibalize their other product offerings. For example, Bombardier has invested over \$600 million in the development of the Q400 turboprop according to a 2001 Flight International report. Continuing to produce a 50-seat jet would result in competition for the turboprop.

**Building a new, more economically viable 50-seat aircraft:** Manufacturers could set up production capacity to build a new aircraft in the 50-seat segment with superior economics. However, the R&D and other investments required to launch such an aircraft could top \$1 billion, if Q400 launch costs are any indication. Not only would this be a high-cost, time-intensive option, but as with the option above, manufacturers may not want to cannibalize their current product offerings and compete directly with new-generation turboprops like the Q400.

**Shift to turbo-prop alternatives:** Although operators are increasing their use of turboprops, these cannot be used as replacements on all routes flown by 50-seat jets. Turboprops such as the Q400 are rarely flown more than 600 miles (although they have a maximum range of approximately 1,100 miles). Fifty-seat jets are regularly used for routes of up to 1,100 miles (with a maximum range of roughly 1,600 miles). So, routes such as New York-Fayetteville (1,144 miles), Denver-Nashville (1,013 miles), or Houston-Minneapolis (1,035 miles) would require a true 50-seat jet replacement.

Turboprops also are not always the most cost-effective option for serving a 50-seat route. A comparison of operating costs for the Q400 versus the 50-seat CRJ-200, as reported by the Bureau of Transportation Statistics, shows that despite better operating economics of the Q400 at short stage lengths, the CRJ-200 economics become more competitive at longer stage lengths. Lastly, passengers still demonstrate a strong preference for jets over turboprops, despite the significant improvement in passenger experience in the new turboprops.

**Extending the life of existing 50-seat jets:** As these aircraft get older, they could be refurbished to extend their life. Radical airframe modification, however, a critical part of the process, is expected to run into the millions of dollars per aircraft and would necessitate frequent heavy airframe checks thereafter. Regional airlines would need to be willing to make a significant investment in the refurbishment process. According to Oliver Wyman cost analysis, refurbishment is unlikely to generate sufficient cost savings for life extension to be a viable long-term solution.

A significant decrease in operating costs through technological upgrades is another prerequisite for extending the life of existing 50-seat jets: Improvements in technology, such as in engine design, can decrease fuel consumption and provide other cost advantages. However, investment cost is highly variable with the type of technology upgrade, plus operators must wait until a major change in technology is available. For a 50-seat jet, the most effective “technological upgrade” would be an airframe refurbishment, which goes back to the economically difficult option described above of extending the aircraft’s life.

**Downgauging existing aircraft types:** Much like the CRJ-705 concept, manufacturers could configure larger aircraft that are still in production to comply with market demand for 50-seat jets, e.g., a 50-seat configuration in the body of a 70-seat aircraft. The benefits of this solution are threefold: First, manufacturers could implement a 50-seat solution quickly (and gain a new product offering), while

operators could capture the savings associated with the CRJ-700, E-170, or MRJ-70 without breaking their scope clause agreements. Second, the ability to operate the aircraft in a dual-class configuration would further enhance the customer experience. Third, if scope clause limitations are relaxed in the future, these jets could be easily converted back to 70-seat aircraft, allowing operators to quickly absorb increased demand on certain routes. However, as a bigger aircraft with the same number of seats, it will suffer a cost disadvantage compared to a new 50-seater.

As these options demonstrate, the discussion about the future of the 50-seat jet is far from over. Most importantly, regional airlines in conjunction with aircraft manufacturers must find a business model that addresses their need for these smaller regional jets while minimizing investment costs, lowering operating costs, and respecting scope clause agreements. A new aircraft management and purchasing model may be required to mitigate the cost disadvantages of the current 50-seat jet and make it a more competitive and flexible choice. ❖

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