The North American & European regional markets have followed similar development trends over the past 10 years. Regional airlines have phased out turboprops and replaced some with larger turboprops and some with medium-sized and larger regional jets.

Development of the North American & European regional markets

The regional markets in North America and Europe have been evolving continuously. Two consistent features of this evolution are that there has been a gradual increase in aircraft size, and that aircraft size in Europe has generally been larger than for North American regional operations.

North American evolution

The North American market has changed since deregulation in 1979, with regional carriers developing into hub feeders. The main regional airlines are therefore those that operate feeder services for major airlines. In the US many of these regional airlines have franchise agreements with US majors, and operate as their regional affiliates. There were several Canadian regional carriers which provided feeder services for Air Canada and Canadian. These regionals were later acquired by Air Canada and consolidated into one regional feeder, Air Canada Jazz. There are other smaller independent regionals that perform a variety of roles, and account for the minority of operations and the aircraft fleet.

The development of the main regional carriers started with turboprops in the 20- to 40-seat classes. The Beech 1900, Metroliner, J31, J41, Emb-110, Emb-120, Saab 340 and Dash 8-100 were the most popular types. In 1995, the fleet of turboprops in the 18- to 20-seat category operated by regional carriers affiliated with major airlines numbered 530, while there were another 680 turboprops in the larger 30- to 37-seat category.

In the mid-1990s, the most popular 20-seat turboprops were the Beech 1900, Jetstream J31 and Metroliner. The most popular types were the Emb-120, Dash 8-100 and Saab 340.

Larger turboprops in the 40- to 50-seat category were also operated in the US by several regional carriers that included: Atlantic Southeast Airlines (ASA) as Delta Connection; Continental Express; Flagship Airlines; Simmons Airlines operating as American Eagle; Piedmont Airlines; and Mesa Airlines. Air BC, Air Ontario, and Canadian Regional operated in Canada. The most popular types in this category were the ATR42 and Dash 8-300, although small numbers of F.27s and Dash 7s were also operated. The number of aircraft in this category totalled 177 in 1995 *(see table, page 6)*.

There was also demand for some larger turboprops, with the only modern type available at the time being the ATR72. This was operated by Trans States, American Eagle and ASA. A total of 48 ATR72s were operated by regional feeders in 1995.

Overall, the main regional feeders operated about 1,430 turboprops in 1995, with the 20-seat and 35-seat aircraft accounting for the largest share.

Traffic growth and the development of regionals had led to the use of some jets in the case of a few airlines. The F.28 was already operated by several carriers, such as Canadian Regional Airlines, which operated 12 to provide feeder services for Canadian, and Horizon Air, which operated eight as feeder services for Alaska Airlines. The F.28 was also operated by US major USAirways. A small number of Avro RJs were also operated, and about 50 70- to 80-seat regional jets were operated in 1995 *(see table, page 6)*.

There was also a fleet of about 160 90- to 100-seat aircraft in 1995. About 40 BAE 146s were operated by regional affiliates. The Fokker 100 was operated by three US majors: American Airlines operating 75; Midway using seven; and USAirways with a fleet of 122.

The development of regional airlines had also led to the introduction of the first smaller regional jets. The Bombardier CRJ-100 entered service in 1992. By 1995 the fleet used by major regional operations in North America had grown to about 40 aircraft. Air Canada had nine, while Comair and Skywest operating as Delta Connection and United Express had another 30.

Overall, the regional fleet of 1995 totalled almost 1,700 aircraft, with about 250 of these being regional jets. About 1,200 aircraft had 40 seats or fewer *(see table, page 6)*.

2000

By 2000 the growth in traffic had led to a requirement for larger types, with 20-seat turboprops giving way to 35-seat turboprops, while the fleet of larger turboprops had grown as airlines in the US reduced their ATR42 and Dash 8-300 fleets.

The 30- to 37-seat Emb-120, Dash 8-100 and Saab 340 accounted for the largest fleets and share of operations by US regional airlines in this period. The Dash 8-100 and -200 were selected by a range of regional carriers in Canada, mainly serving hubs used by Air Canada and Canadian. They were also operated by several US regional feeders that included Allegheny, CCAir, Horizon Air, Piedmont and Mesa Airlines.

The 30- to 37-seat turboprops comprised the largest aircraft category in 2000.

Since 1995, the Metroliner and Emb-110 had been phased out by US regional

DEVELOPMENT OF NORTH AMERICAN REGIONAL AIRCRAFT FLEET 1995 TO 2010

Aircraft category	1995	2000	2010
20-seat turboprops	530	303	13
30- to 37-seat turboprops	677	787	214
40- to 50-seat turboprops	177	106	39
Large turboprops	48	79	80
Total turboprops	**1,432**	**1,275**	**346**
35-seat jets	0	38	27
50-seat jets	39	375	1,190
70- to 80-seat jets	52	88	574
90- to 100-seat jets	162	150	115
Total regional jets	**253**	**651**	**1,906**
Total all aircraft	**1,685**	**1,926**	**2,252**

feeders, and the J31 fleet had more than halved over the same period. The Beech 1900 remained popular, but overall the fleet of 20-seat turboprops declined by more than 225 aircraft over the five-year period. The need for larger turboprops also grew for some regional carriers, and Horizon Air was one of the first Q400 operators in North America. It was operating a fleet of 30 by 2000. The number of ATR72s was similar to the fleet of 1995. The fleet of large turboprops in 2000 was about 80 units.

The fleet of turboprops operated by regional feeders in North America was about 1,275 aircraft; 75 fewer than in 1995.

Although regional airlines were migrating from mainly 20- seat and 35-seat types to larger aircraft, 50-seat turboprops were not in demand.

The arrival of the first smaller RJs in the 1990s was followed by huge growth in the 50-seat RJ fleet, with numbers increasing from 40 in 1995 to about 375 in 2000. The CRJ-200 became as popular as the CRJ-100, and the two were operated by all regional feeder airlines in the US and by Air Canada. The CRJ-100/-200 fleet numbered 245 in 2000. The ERJ-145 entered service in 1996 and numbered 130 aircraft by 2000. It was operated by Continental Express and American Eagle in large numbers.

The advent of 50-seat RJs was followed by the smaller 35-seat RJs. The Embraer ERJ-135 entered service in 1999, and was also acquired by Continental Express and American Eagle, and the ERJ-135 fleet totalled 28 by 2000. The Do 328Jet achieved some orders with Skyway and Atlantic Coast Airlines (ACA); and a total fleet of 10 was in service.

The number of 35- and 50-seat RJs in 2000 therefore totalled more than 400 aircraft, with these smaller RJs accounting for the second largest category of regional aircraft in 2000.

Scope clauses

The steady increase in aircraft size, migration from turboprop to jet fleets, and the use of the 100-seat Fokker by three US majors led to labour problems for the US majors. The overall concern of the major airlines' pilot unions was that the gap in aircraft size between them and their feeder partner regional airlines was gradually closing. Moreover, the issue was that the regional partners, with lower pilot salary scales, would ultimately be given the task of operating a larger number of routes with lower traffic densities and shorter mission lengths. Pilot unions were worried that the transfer of these operations to the regional feeders would lead to fewer pilots being required by the major carriers.

These concerns led to the development of scope clauses. These contracts that pilot unions have with the major carriers limit the number of RJs in each seat-size category that major airlines can use. The number of jets permitted generally decreases as the aircraft size increases. The scope clauses of American Airlines and Delta Airlines were stringent enough to limit the number of 50-seat RJs. As a response, Embraer and Bombardier launched 40-seat variants of the ERJ-145 and CRJ-200; the ERJ-140 and CRJ-440.

Scope clauses therefore limit the use of larger RJs by US majors. A few airlines were able to order some larger RJs, either before scope clauses were used, or because scope clauses allowed a small number of RJs. Air Wisconsin operated 17 BAE 146s, and became a feeder carrier for United Airlines. Mesaba Airlines was a feeder carrier for Northwest, and operated 36 Avro RJ85s.

Meanwhile, Alaska Airlines' regional partner Horizon Air was one of the few airlines not to be affected by a scope clause, and operated 23 F.28s. Canadian Regional Airlines operated 29 F.28s, while operating as a regional feeder for Canadian. Canadian regional airlines Air BC and Air Nova have small fleets of BAE 146s.

The Fokker 100, while similar in size to the BAE 146-300, was used by American Airlines, USAirways and Midway Airlines as a mainline aircraft. Aircraft size of about 100 seats therefore became the approximate unofficial dividing line between a major airline and its regional partner carrier.

About 90 70- to 80-seat RJs and about 150 90- to 100-seat RJs were used in 2000. The total number of regional aircraft in 2000 had therefore grown to more than 1,900. While 35-seat turboprops and smaller RJs were the most numerous types, 20- and 50-seat turboprops had decreased in number from 1995 *(see table, this page)*.

2000 to 2010

There have been several developments over the past 10 years in the North American regional market, including some consolidation among major airlines.

The first development was the absorption of Canadian by Air Canada. The regional Canadian airlines serving these two majors were also consolidated, so Air BC, Air Nova, Air Ontario, and Canadian Regional Airlines were therefore grouped into Air Canada Jazz.

There have also been two consolidations of major airlines in the US. The first was the merging of America West into USAirways in 2005, followed by the merging of Northwest with Delta Airlines in 2008.

The terrorist events of September 2001 created several difficulties for US majors, which have struggled to regain long-term profitability ever since. The events of 2001 coincided with an expansion and growing market presence of low-cost carriers (LCCs), in particular Southwest, Air Tran and jetBlue. The domestic networks of the US majors have gradually been shrinking ever since. In some cases market share has been lost to LCCs. In others, operations have been transferred from the majors to their regional partners, although this has been limited by scope clauses. Scope clauses have been renegotiated on several occasions by US majors since 2001, mainly as part of airline restructuring programmes.

As a result of this, regional airlines have continued utilising more and more

NORTH AMERICAN REGIONAL AIRCRAFT ACTIVITY 2000 & 2010

Aircraft category	Number of operations 2000	Number of seats 2000	Number of operations 2010	Number of seats 2010
20-seat turboprops	1,074,156	19,873,308	334,108	6,270,535
	9.33%	1.82%	3.49%	0.68%
30- to 37-seat turboprops	2,179,778	72,693,778	614,265	21,035,970
	18.94%	6.65%	6.42%	2.28%
40- to 50-seat turboprops	261,605	12,348,409	128,114	6,258,002
	2.27%	1.13%	1.34%	0.68%
Large turboprops	108,070	7,158,992	240,634	17,342,826
	0.94%	0.65%	2.51%	1.88%
35-seat jets	38,673	1,183,392	58,636	2,169,532
	0.34%	0.11%	0.61%	0.23%
50-seat jets	945,271	47,263,650	2,372,083	117,651,698
	8.21%	4.32%	24.79%	12.73%
70- to 80-seat jets	192,559	13,165,389	1,084,904	79,461,378
	1.67%	1.20%	11.34%	8.60%
90- to 100-seat jets	309,019	28,744,000	185,554	18,030,059
	2.69%	2.63%	1.94%	1.95%
Total regional aircraft	**5,109,131**	**202,431,113**	**5,018,298**	**268,220,000**
	44.40%	**18.51%**	**52.44%**	**29.03%**
Small narrowbody jetliners	1,443,417	159,920,897	424,254	53,559,013
	12.54%	14.63%	4.43%	5.80%
Medium narrowbody jetliners	3,995,641	547,691,904	3,495,056	494,218,008
	34.72%	50.09%	36.52%	53.49%
Large narrowbody jetliners	641,497	109,812,018	411,215	76,634,220
	5.57%	10.04%	4.30%	8.29%
A300/A310/767	221,931	46,267,323	78,363	16,318,694
	1.93%	4.23%	0.82%	1.77%
Medium & large widebodies	95,554	27,345,413	19,392	4,245,180
	0.83%	2.50%	0.20%	0.46%
Total jetliner types	**6,398,040**	**891,037,555**	**4,428,280**	**644,975,115**
	55.60%	**81.49%**	**46.27%**	**83.50%**
Overall total	**11,507,171**	**1,093,468,668**	**9,570,043**	**923,909,056**

RJs, and have progressed towards larger types.

The number of 20-seat turboprops in operation with major regional feeder carriers has diminished to almost zero *(see table, page 6)*. A large number are still utilised by independent and niche regional operators.

The utilisation of 30- to 37-seat turboprops by US regional feeders has also declined. About 800 were operated in total by North American airlines in 2000, and the number had fallen to about 200 in June 2010.

The Dash 8-100 and Saab 340 remain the most popular types. A large fleet of Dash 8-100s is still operated by Air Canada Jazz.

Many of these regional airlines have now phased out their 35- and 50-seat turboprops and replaced them with 35- and 50-seat RJs. Mesaba, Air Canada Jazz, Mesa Airlines and Skywest still operate the Emb-120, Dash 8-100 and Saab 340, but in smaller fleets than in 2000.

The fleet of 45- to 50-seat turboprops also declined from 2000 to 2010. All airlines have phased out the ATR42. The number of Dash 8-300s, however, increased up to 2010. Air Canada Jazz operates 28 of the type.

The number of turboprops in the three size categories up to 50 seats serving US majors declined from 1,384 in 1995 to just 266 in 2010. These have been largely replaced by the Embraer ERJ family and the CRJ-100/-200, with numbers now totalling more than 1,200. The ERJ-145 and CRJ-200 are the most popular, each with fleets of more than 450 units. Small RJs have therefore replaced 20-, 35- and 50-seat turboprops almost on a one-for-one basis.

The fleet of large turboprops remains similar in size to that of 2000. There have been major fleet changes, however, since all ATR72s have been phased out by US regionals, with many being replaced by similar sized RJs. The Q400 fleet has grown over the past 10 years. Horizon Air now operates 40 Q400s, and Colgan Air, a feeder for USAirways, operates 14. Porter Airlines in Canada has achieved success by operating the Q400 from Toronto City Airport, opening up a complete new network of routes.

There has also been a lot of growth in the 70- to 80-seat RJ category, while the number of 90- to 100-seat jets has experienced a small net decline.

The growth in the number of 70- to 80-seat RJs has followed the introduction of the Bombardier CRJ-700 and -900 variants into service in 2001 and 2003, and the Embraer E-Jets family from 2004 to 2006.

The CRJ-700, CRJ-900, E-170 and E-175 all fit in the 66- to 86-seat category. The number of these in operation has grown fast, although numbers have been limited by airline scope clauses. The CRJ-700 is the most popular, with 255 in operation, and is operated by most US regional affiliate carriers, as well as Air Canada Jazz. The CRJ-900 is also operated by several US regionals, although not as many as the CRJ-700.

The E-170 and E-175 are the alternative choices to the CRJ-700 and -900. Although they arrived later than the CRJ models, the E-170/-175 are not operated in smaller numbers. They have been selected by Republic Airlines, providing feeder services for Frontier and USAirways; Shuttle America, providing feeder services for United and Delta; and Compass Airlines, providing feeder services for Delta. The E-175 is also operated by the mainline carrier Air Canada.

Despite the limitations of scope clauses, which have been relaxed to an extent over the past 10 years, the 70- to 80-seat category of RJs has grown from fewer than 100 aircraft to almost 600 *(see table, page 6)*. The 50-seat and 70- to 80-seat jets have therefore become the two largest sub-fleets of all regional aircraft in 2010. They have eliminated most turboprops, at the same time as increasing average aircraft size. The only outstanding orders for RJs in the 70- to 80-seat category are the 24 placed by American Eagle and Mesa Airlines for the CRJ-700.

Despite many US majors being limited by scope clauses, airlines like USAirways have used some of the larger regional jets they have acquired to open new routes from their hubs.

The larger E-190 entered service in 2005, and has been acquired by the regional feeder Republic, but also by major airlines jetBlue and USAirways. jetBlue operates 40 aircraft, and has orders for a further 58 aircraft. USAirways has a fleet of 15 aircraft, the number being subject to a scope clause limitation.

In parallel with the E-190's introduction, the Fokker 100 has been phased out by its major US airline operators, as part of a fleet rationalisation programme in the case of American Airlines and USAirways. There has therefore been a net reduction in the 90- to 100-seat jet fleet from 150 to 115 units. The fleet will surpass the 2000 level, however, when all of jetBlue's E-190s have been delivered. jetBlue selected the E-190 to operate on lower-density routes than those operated with the A320. Some of the routes operated with the E-190 are new city-pairs.

Market development

The overall trend in operations and aircraft types in North America is also revealed when analysing the market on a macro scale. The number of annual operations and seats provided by each type in 2000 and in 2010 reveals several trends. Aircraft are grouped into 13 categories of aircraft *(see table, page 8)*. The first of these are the four groups of turboprops; the 20-seat, 30- to 37-seat, 45- to 50-seat and large turboprops, as described.

The next four categories comprise the 35-seat, 50-seat, 70- to 80-seat and 90- to 100-seat regional jets.

The next five categories are three groups of narrowbodies and two widebody categories.

The main trend from 2000 to 2010 is that there has been a decline in the number of operations and seats provided by the three smaller categories or turboprops, the group of large RJs, the smallest narrowbodies, and all widebodies. The categories of aircraft that have increased their share of operations are large turboprops, 35-seat RJs, 50-seat RJs and 70- to 80-seat RJs; the latter having undergone a tenfold increase in its share since 2000 *(see table, page 8)*.

Not surprisingly, larger narrowbodies and widebodies now account for a smaller share of operations than they did in 2000.

The other notable trend is that the share of operations carried out by regional aircraft has increased from 44% to 52% over the past 10 years, while the share of scheduled seats provided by regional aircraft has increased from 18% to 29% over the same period. This reflects the shift of services from majors to regional partners. The average regional aircraft size has increased from 40 to 53 seats.

RJ deployment

While a large number of RJs have been acquired by North American airlines to replace their fleets of smaller 20- and 35-seat turboprops, not all RJs acquired in the past year have been selected to provide higher capacity for growth on established regional operations. RJs have also been acquired to supplement or replace jetliners on some routes, and to open new routes.

In the case of providing capacity on existing routes, this can either be with regional or major carriers operating RJs. The RJs can also be used to replace jetliners, or to optimise capacity requirements by substituting some jetliners with smaller RJs.

There are a large number of cases, however, where RJs have been utilised over the past 10 years to open new routes, by airlines including: Air Canada, Porter Airlines, Alaska Airlines, American Eagle, Branson Air Express, Continental Airlines, Delta Airlines, Frontier Airlines, jetBlue, Midwest, United and USAirways.

As described, Porter Airlines has created a complete new operation from Toronto City Airport (YTZ) with the Q400. Routes it has opened over the past 10 years include Ottawa, Quebec, Halifax, Moncton, Montreal and Thunder Bay in Canada; and Boston, Newark and Myrtle Beach in the US.

Air Canada, meanwhile, has used its E-170s mainly to operate on established routes. A large section of the E-190 fleet, however, has been used to open a range of new inter-Canadian routes from its Ottawa, Montreal, Calgary and Toronto hubs. It has also opened a small number of trans-border routes.

Delta and its regional affiliates have opened by far the larger number of routes. This has been accomplished with a variety of aircraft types that include the ERJ-145, The CRJ-700, CRJ-900 and the E-175. Delta, merged with Northwest since 2008, operates from nine main hubs, and has opened new routes from all of these.

All four types have been used on the new routes, and in many cases the small ERJ-145 has been used on routes of up to 500nm. Nearly 80 new routes have been opened from these nine hubs, so most or all of Delta's new routes are to additional spokes not previously served. All new sectors from Atlanta are with the CRJ-700 and -900, and examples include Aspen, Birmingham, Panama City (Florida), Sioux Falls, Montreal and Toronto. Three new routes have also been opened from Cincinnati, and use the ERJ-145, CRJ-700 and CRJ-900.

A small number of routes has also been started from Washington Reagan airport, New York JFK and New York La Guardia. A greater number has been started from Detroit, mainly using the CRJ-700 and -900, but also the E-175.

American Airlines operates from seven main hubs, including Dallas-Fort

Worth and Miami. In all, it has opened more than 40 new routes using the ERJ-145, including 25 from Dallas and 11 from Miami.

Independent carrier Branson Air Express operates from Branson airport, Missouri and operates a fleet of ERJ-145s. The airline operates to eight destinations.

Continental has three main hubs at Cleveland, Newark and Houston, and has used the ERJ-145 to open 23 new routes since 2000, most of which are within a few hundred miles of their hubs. The majority originate from Newark, while about eight have been launched from Houston.

Frontier Airlines has used the E-190 to open about 10 new routes, nine of which originate from Denver. Three in particular to Albuquerque, Branson and Kansas City have relatively high frequencies, and most of the new routes range in length from 300nm to 1,200nm.

jetBlue, which started operations in 2000 and has grown its network every year, now accounts for the largest number of services from JFK and Boston. Following a large number of services it started with the A320, it has opened 32 new routes, mainly from JFK, Boston and Long Beach. Most of these routes are in excess of 600nm, although there are a few short ones from JFK. Examples from JFK include Atlantic City, Austin, Charlotte, Houston, Jacksonville, Portland and Sarasota.

United Airlines operates from five main hubs at Denver, Chicago, Washington Dulles, Los Angeles and San Francisco. It has used the ERJ-145, E-170 and mainly the CRJ-700 to open about 45 new routes from these hubs over the past 10 years. Many of these are long, and in excess of 700nm.

USAirways has opened about 20 new routes from its five main hubs of Charlotte, Washington Reagan, La Guardia, Pittsburgh and Philadelphia. These have largely been with the E-170 and E-175 operated by its regional affiliates and with the E-190s operated by USAirways. The CRJ-700 and -900 are also used by regional affiliates in a few cases.

Alaska Airlines has used the Q400 to open a large number of mainly short-distance routes since 2000. Most of these are from its operational hubs at Los Angeles, Sacramento, Portland Oregon, and Seattle.

European evolution

As in North America, in Europe there has been a migration to larger aircraft, and from turboprops to jets, over the past 10 years. Relationships between major airlines and regional carriers did not develop as fast in Europe as they did in North America. There are a larger number of regional airlines that are independent of major airlines, and there is a less pronounced hub-and-spoke route structure amongst major airlines. There is therefore a less defined network of feeder routes provided by regional airlines. Nevertheless, several relationships between major and regional airlines have developed over the past 10 years, although a large number of regional routes are those that have low traffic volumes and are generally shorter in length. There are plenty of city-pairs that have never had the potential traffic volumes for jetliner service, and are too long to be operated by turboprops. Many of these have now become viable with the advent of larger or appropriately-sized RJs.

Independent regionals

The increased levels of competition in the European Union, freedom for airlines to operate between all member states, and the use of the internet increasing fare visibility for passengers, have seen some airlines develop into strong independent carriers with large networks and fleets. One example is the UK carrier Flybe, which is the largest British domestic

airline, operating the country's largest domestic network from 16 UK airports, which do not include London Heathrow. It also operates to other European countries. It has a fleet of 54 Q400s and 14 E-195s.

Flybe evolved from the merger of several airlines, starting as Jersey European in 1979. It later became British European and then changed to Flybe in 2002. In 2006 it acquired BA Connect, with the exception of its operations from London City (LCY) Airport, which are now operated by BA Cityflyer. BA Connect was itself formed from a combination of several British regional carriers that included Brymon, British Regional Airlines, and Cityflyer Express. Flybe also operates a franchise agreement for the Scottish regional carrier Loganair. This merging rationalised the fleets of several carriers, which previously operated a mix of Dash 7s, Dash 8-200s and -300s, BAE ATPs, BAE J31s, ATR42/72s, and ERJ-145s.

Flybe's route network is extensive, and it has opened a large number of new routes over the past 10 years, from Aberdeen, Birmingham, Edinburgh, Humberside, Jersey, London Gatwick, Manchester and Newcastle. The largest number of routes it has opened operate from Exeter and Southampton, which total about 40. The airline is using the Q400 for UK domestic and shorter intra-European routes, and the E-195 for longer European sectors. Flybe also has 35 E-175s and 12 Q400s on order.

Cimber Air of Denmark is another airline that has expanded, as well as acquiring 737NG operator Sterling Airways to become Cimber Sterling. In its own regional operations, it has grown from 12 ATR42s and three ATR72s in 2000 to a fleet of 7 ATRs plus 13 CRJ-100/-200s in 2010.

Sun-Air of Scandinavia has also grown over the same period from three BAE ATPs and seven J31/41s to a fleet of six Do 328s, two J31s and five Do 328Jets.

Examples in Germany of independent regional airlines are Augsburg Airways, Cirrus Airlines, ContactAir Flugdienst and OLT. All five of these airlines have increased their fleets, and have either phased out smaller turboprops for larger types or removed all turboprops. They have also added RJs of at least 70 seats in all cases.

German regional carrier LGW, based at Dusseldorf, Berlin and Dortmund, was acquired by Air Berlin in 2007. LGW operates domestic and some intra-European services. In 2000 it operated just four Do 228s, and now has a fleet of 10 Q400s in Air Berlin livery. The carrier has opened several new routes from Dusseldorf, Karlsruhe, Munster, Nuremburg, Stuttgart and Berlin with the Q400. Many of these are to destinations in Italy, Poland, France and Croatia.

Carpatair is an independent Romanian regional airline that has become the largest regional carrier in Eastern Europe. It stared operations in 1999 with a fleet of two Saab 340s. It has now grown to serve 29 destinations and operates with 12 Saab 2000s, three Fokker 70s and three Fokker 100s.

Another regional carrier that has enjoyed considerable expansion is Eastern Airways in the UK, which operates domestic services. In 2000 the airline operated seven J31s, and in 2003 12 J41s and several routes were transferred from BA CitiExpress to Eastern Airways. The airline has expanded its network, including some intra-European routes, and now operates 20 J31/41s, two ERJ-135s and eight Saab 2000s.

In 2010 Eastern Airways bought Air Southwest, which began operations from the south-west of the UK in 2003 and had a fleet of five Dash 8-300s.

Associated regionals

The development of regional carriers in Europe over the past 10 years has clearly followed a pattern: increased fleet sizes; the move to larger turboprops and

DEVELOPMENT OF EUROPEAN REGIONAL AIRCRAFT FLEET 1995 TO 2010

Aircraft category	2000	2010
20-seat turboprops	403	193
30- to 37-seat turboprops	209	175
40- to 50-seat turboprops	404	222
Large turboprops	153	257
Total turboprops	**1,169**	**847**
35-seat jets	82	114
50-seat jets	111	98
70- to 80-seat jets	50	193
90- to 100-seat jets	255	299
Total regional jets	**498**	**704**
Total all aircraft	**1,667**	**1,551**

Aircraft category	Number of operations	Number of seats	Number of operations	Number of seats
20-seat turboprops	2.2%	0.4%	1.2%	0.2%
30- to 37-seat turboprops	7.1%	2.2%	3.6%	1.0%
40- to 50-seat turboprops	13.4%	6.1%	4.7%	1.8%
Large turboprops	6.4%	4.0%	8.4%	4.8%
35-seat jets	0.7%	0.2%	0.4%	0.1%
50-seat jets	6.4%	3.0%	5.4%	2.1%
70- to 80-seat jets	4.8%	3.6%	7.4%	4.8%
90- to 100-seat jets	6.4%	5.9%	4.7%	3.8%
Total regional aircraft as a % of all operations	**47.2%**	**25.3%**	**35.7%**	**18.5%**
Small narrowbody jetliners	8.4%	9.1%	5.8%	5.3%
Medium narrowbody jetliners	39.6%	55.9%	57.2%	73.8%
Large narrowbody jetliners	2.9%	5.5%	0.8%	1.5%
A300/A310/767	1.4%	3.1%	0.2%	0.4%
Medium & large widebodies	0.4%	1.0%	0.2%	0.4%
Total jetliner types	**52.8%**	**74.7%**	**64.3%**	**81.5%**

medium- and large-sized RJs by most airlines; the transfer of some operations from major airlines to regional ones; and the opening of a large number of new routes.

As described, the acquisition of BA Connect by Flybe in 2006 still left BA Connect with its operations from LCY using RJ100s. BA Connect has since expanded its network from LCY, adding routes to Barcelona, Copenhagen, Ibiza, Madrid, Nice and Panama. In the same period it has also replaced its Avro RJs with E-170s and E-190s.

Finncomm provides regional services for Finnair, and operates 12 ATRs and two E-170s. Finnair itself operates eight E-170s and 10 E-190s; the Finnair group having expanded its regional operations. The airline has opened several new routes using Embraer E-jets from its Helsinki base. These include Geneva, Manchester, Bucharest, and Stuttgart.

Tyrolean is part of the Austrian Airlines Group, and has grown its fleet over the past 10 years to add 15 Fokker 100s, seven Dash 8-300s and 11 Q400s. The Austrian Group has added several new routes with this fleet expansion, with 10 new destinations being served from Vienna, and all routes being up to about 600nm.

One of the largest regional operations serving a major European airline is the group of regional airlines serving Air France. Over the past 10 years Flandre Air, Proteus and Regional Airlines have merged in to one carrier, Regional, and have consolidated its mixed fleet of mainly small turboprops and 12 ERJs into an all-jet fleet of 18 Embraer E-Jets, 35 ERJs and three Fokker 100s.

In addition Airlinair, which provided feeder services for Air France was acquired by Brit Air, which itself become a wholly-owned subsidiary of Air France in 2000. The two airlines operated 14 ATRs, 20 CRJ-100s and seven Fokker 100s in 2000. This fleet has grown to 23 ATRs, 14 CRJ-100s, 17 CRJ-700s and 10 Fokker 100s. The fleet of RJs of 70 seats or more has grown from seven in 2000 to 48 in 2010.

Air France has opened a large number of French domestic and intra-European routes over the past 10 years in its regional operations, from its bases in Bordeaux, Paris CDG, Lyons and Toulouse.

CityJet, although an Irish carrier, has its operations based from hubs at London City Airport, Paris, Rotterdam and Antwerp, in addition to Dublin. Its first operations in 1996 were between London City (LCY) and Dublin, and it later started operating from LCY to Paris on behalf of Air France. Its fleet in 2000 comprised two Saab 2000s and six BAE 146s. Air France bought the carrier in 2002, and Air France-KLM later bought the Belgian airline VLM. VLM therefore started to operate under the name of CityJet, with VLM's Fokker 50s becoming part of the CityJet fleet.

CityJet now operates flights with prefixes for Air France, KLM and VLM, as well as its own services. Its fleet has grown to 24 BAE Avro RJ85s and 16 Fokker 50s.

There is a group of five airlines providing regional services for Lufthansa, which are known as Lufthansa Regional. The largest of these five airlines is Lufthansa Cityline.

Lufthansa Cityline, which has always operated an all-jet fleet, has grown from 55 aircraft in 2000 to 65 jets in 2010. The number of 70-plus seat jets has increased from 18 to 59, and it has a further six large RJs on order.

Eurowings, which is another member of Lufthansa Regional and 49% owned by Lufthansa, has swapped its mainly BAE 146 fleet a mix of CRJ-200s/-700s/-900s.

Air Dolomiti, based in Italy, is also part of the Lufthansa Regional group, and is wholly-owned by Lufthansa. Air Dolomiti serves a large number of Italian cities from Frankfurt and Munich, and a few from Vienna. It added five E-195s to its fleet of 17 ATRs in 2000.

Although it is independent of major airlines, Cirrus Airlines established a co-operative partnership with Lufthansa and is a Team Lufthansa franchise member. Cirrus acquired Augsburg Airways in 2002.

Contact Air is also a Team Lufthansa partner and operates domestic German routes. Its fleet has developed from 11 Fokker 50s in 2000 to eight Fokker 100s in 2010.

Overall, all five airlines in the

Not only have many of the regionals in Europe opened large numbers of new aircraft over the past 10 years, but they have also acquired almost 200 RJs of 70 seats and larger. The average aircraft size in European regional operations has increased by eight seats to 65 over the past 10 years.

Lufthansa Regional Group have developed their fleets towards a reduction in the number of turboprops and a larger number of large RJs over the past 10 years. The number of large RJs has risen from 28 to 93.

This fleet expansion has allowed a large number of new routes to be opened from several German hubs. Examples from Frankfurt are Bergen, Gdansk, Poznan and Stavanger. A larger number of new routes has been opened from Dusseldorf, and these include Bilbao, Edinburgh, Gdansk, Kiev, Newcastle and Bucharest. The group has created the largest expansion from Munich, with routes to 17 new destinations being opened over the past 10 years. All of these have mainly been with the larger variants of the CRJ and the Embraer E-Jets.

Luxair has no regional partners, and operates all regional services itself. It began operations with the ERJ-145 in the late 1990s, while already operating four Fokker 50s. Luxair's regional operation has since grown, with four Q400s having supplemented the Fokker 50 fleet and eight ERJs are in operation. The airline has opened a large number of new routes over the past 10 years with these aircraft, with its main routes being from Luxembourg to Milan, Palermo, Prague and Berlin.

KLM Cityhopper is the result of the merger and acquisition of four regional airlines over the past 10 years. KLM Cityhopper is a wholly-owned subsidiary of KLM, and it provides a regional feed to KLM's operations at Amsterdam and regional services across its network. Despite having increased its number of larger RJs, KLM Cityhopper has opened few new routes since 2000.

Eurolot is a regional subsidiary of LOT Polish. Both airlines operate regional services. The operation has been expanded, principally with LOT's fleet of 21 E-170s/-175s. The airline has partially used this fleet to open new routes from Warsaw, Krakow and Gdansk. These are mainly to Frankfurt, Belgrade, Geneva, Odessa and Georgia.

While an independent airline, Air Nostrum is a franchisee of Iberia. Air Nostrum acquired Binter Mediterranee in 1999. Air Nostrum's fleet has grown from 35 aircraft in 2000, most of which were only up to a 50-seat capacity, to about 65 units, including five ATR72s and 11 CRJ-900s. It also has 10 ATR72s, nine CRJ-900s and 35 CRJ-1000s on order.

Air Nostrum's fleet expansion has provided capacity for the opening of a large number of new routes, particularly from Iberia's main hub at Madrid and also from Valencia.

British Midland (BMi) Regional has grown its ERJ fleet as it has expanded its network, and has added six routes over the past 10 years.

Malev has added a small fleet of Q400s and used it to add some regional routes to seven east European destinations.

Croatia Airlines swapped its small fleet of ATR42s for six Q400s and has opened several new routes from Dubrovnik and Zagreb.

A few new airlines have also emerged over the past 10 years. Niki of Austria started operations in 2003, and co-operates with Air Berlin. As well as operations to France, Italy, Spain and Switzerland mainly using A320 family types, it also operates five E-190s on shorter routes from Vienna.

European regional development

The general trend in Europe has been towards airlines growing fleets, phasing out smaller turboprops and adding medium- and large-sized RJs. This trend is clearly not hindered by scope clauses in European carriers, as they are with US airlines.

The most popular turboprop over the past 10 years has turned out to be the Q400, with a net fleet increase of 119 aircraft. This compares to a net increase of 20 ATR72s. The E-Jets have succeeded in winning more orders, with 145 in operation versus 103 CRJ-700s and -900s. There are a further 57 outstanding orders for E-Jets and 60 orders for the CRJ-700/-900.

The Fokker 100, meanwhile, has been a popular used aircraft, with several European carriers acquiring examples of it over the past 10 years to expand their jet fleets. The European Fokker 100 fleet has increased by four over the past 10 years. The BAE 146/Avro RJ fleet has declined by 52 aircraft over the same period.

An analysis of operations and seat numbers of different aircraft categories for 2000 and 2010 reveals several trends. One significant trend is that the percentage of operations and seats has increased for large turboprops, 70- to 80-seat RJs, and medium-sized narrowbodies. The second trend is that, converse to the North American market, the portion of operations and seats provided by regional aircraft has decreased over the past 10 years. This is mainly explained by the large expansion in the number of operations provided by medium-sized narrowbody jets, mainly due to high growth LCC services *(see table, page 14)*. The reduction in portion of services and seats provided by regional aircraft is also due to about a 12% decrease in operations and 7% decrease in scheduled seats, reflecting a degree of consolidation in regional operations. The size of the average aircraft, however, has increased from 57 to 65 seats. AC