

The market for turboprops and regional jets in North America and Europe has shown significant changes since 2000. Scope clauses led to a boom in 50-seat regional jet deliveries in the early-2000s, replacing many small turboprops in the process. Subsequent relaxation of these has allowed larger RJs to enter the market. Turboprops are also making a comeback.

The market for turboprops & regional jets in North America & Europe

The past decade has seen clear signs of a change in the turboprop and regional jet (RJ) market in North America and Europe, as well as globally. Trends of lower seat yields and higher operating costs (in particular, fuel costs), have forced the parking and retirement of many 50-seat RJs in favour of higher capacity RJs, which have lower seat-mile costs, and turboprops, with better fuel efficiency. Relaxation of many pilot union scope clauses in the US major airlines has also allowed their regional partners to operate far more 70-90-seat RJs than was possible in the past.

The development of the turboprop and RJ market in both North America and Europe is examined here; as is the development of the fleet, market for aircraft, and airline route and network from 2000 to 2011, together with the outlook for the future of the turboprop and RJ market.

Fleet development

There has been a clear change in the turboprop and RJ market since 2000. Ten to 15 years ago, there was a wide range of 20-50-seat turboprops available, from several manufacturers including Saab,

Fairchild, Shorts and Fokker.

This range of turboprops was superseded by an influx of 50-seat RJs, particularly in North America. "The late 1990s and early 2000s, which were known as the 'jet-mania' years, were dominated by the entry of 50-seat RJs into the market," says Filippo Bagnato, chief executive officer at ATR. "This forced several turboprop manufacturers out of the market, with only ATR and Bombardier continuing to maintain turboprop production.

"Now in 2012, however, turboprops have begun making a comeback, while 50-seat RJs are in decline. "With the increase in fuel costs and a more competitive market, regional carriers are now more focused than ever on looking for lower operating cost solutions, so they are gradually returning to turboprops. This is a clear trend reversal when compared to the early 2000s," concludes Bagnato.

The number of 70-90-seat RJs entering the market in the same period up to 2011 has also increased. Many of these have replaced 50-seat RJs in North America, due to both fleet and network development, and the relaxation of scope clauses which allowed this development. "The 50-seat RJ fleet has been shrinking

since 2005, when it peaked at 1,700 units. The reduction is mainly due to natural growth to the larger capacity 70-seat RJs following scope clause relaxation in the US," says Luiz Sergio Chiessi, vice president marketing at Embraer. "The 70-seat RJ fleet increased from 280 aircraft in 2000 to 860 in 2012; an annual growth rate of 9.8%. This fleet is clearly a significant part of today's aviation network and has provided much needed flexibility to airlines by right-sizing (complementing or replacing) larger narrowbody jets, replacing ageing aircraft, developing new markets and supporting traffic growth on routes that were previously operated by 50-seat RJs."

This trend towards increasing the size of RJs can also be seen in Europe, although with fewer pilot union scope clauses in effect there, this has actually been caused by operators wishing to reduce seat-mile costs. "For regional carriers, it is becoming more and more difficult to remain profitable when operating the smaller RJs," says Bagnato. "This is mainly due to the increasing costs of operation, stronger competition and the fact that they only have 50 potential sources of revenue to compensate for increasing costs."

Turboprop fleet

In 2000, the turboprop fleet consisted of several types from a variety of manufacturers. This included the Saab 340 and 2000, Embraer 110 and 120, Fairchild Metro, Fokker 50, and early versions of the Dash-8 (-100/-200/-300), among others. By 2011, however, only two turboprop families were still in production: the ATR42/ATR72 and the Bombardier Dash-8 Q400.

This is because of the favour shown by the market to RJs over the past 10-15 years, which resulted in the decline of active turboprops in North America and Europe. There were about 1,700 turboprops in active service in North America in 2000, with the market broadly split between the Beech 1900, Dash-8 (-100/-200/-300), Saab 340, Jetstream 31/41, and Fairchild Metro. The turboprop fleet in North America has diminished since then, however, and by 2011 had dropped to about 1,000 aircraft (*see table, this page*); a reduction of 41%.

The most numerous turboprop type in service in North America in 2011 was the Dash-8 of all variants (*see table, this page*). The largest operators of older Dash-8 variants (-100/-200/-300) in North America in 2011 were Air Canada Jazz (64 aircraft) and Piedmont Airlines (44). The largest operators of the Q400 series of the Dash-8 in 2011 were Horizon Air (41), Colgan Air (27), and Porter Airlines (26).

Europe showed similar reductions in the turboprop fleet from about 1,000 active aircraft in 2000 to 673 in 2011 (*see table, this page*); a 32.7% reduction.

ATR42s, ATR72s, and Fokker 50s were the most numerous types in 2000. By 2011, the Fokker 50 had been supplanted by the Bombardier Dash-8, and in particular the Q400 series. The largest operators of Q400s in Europe in 2011 were Flybe (47 aircraft) and Tyrolean Airways (14). The ATR72 was the second most numerous active turboprop type in Europe in 2011. Its largest operators are Flybe Nordic (11) and Air Dolomiti (10).

RJ fleet

While the turboprop fleet declined on both continents from 2000 to 2011, the RJ fleet experienced significant growth over the same period. This growth was highest in North America. The RJ fleet grew by 192% from about 650 active aircraft in 2000, to 1,900 aircraft by 2011 (*see table, this page*).

From 2000 to 2011 50-seat RJs accounted for much of this growth, as the active Bombardier CRJ-200 fleet doubled in size, and the Embraer ERJ-145 fleet tripled in size.

TURBOPROP FLEET BREAKDOWN BY REGION 2011

Aircraft type	North America		Europe	
	Active	Parked	Active	Parked
ATR42	22	5	69	6
ATR72	39	9	119	38
BAe ATP	0	0	4	4
Beech 1900	172	23	30	0
DHC6	103	19	18	0
DHC7	14	3	0	0
DHC8-100/-200/-300	215	14	41	10
DHC8-Q400	127	9	127	10
Dornier 228	15	2	8	3
Dornier 328	8	9	21	13
EMB-110	8	8	0	3
EMB-120	62	5	4	2
Fairchild Metro	103	14	27	5
Fokker 50	0	0	33	18
Jetstream 31/41	46	32	50	10
Let L-410	0	0	31	13
Saab 2000	3	0	36	0
Saab 340	69	92	52	11
Shorts 360	9	5	3	2
TOTAL	1,015	249	673	148

REGIONAL JET FLEET BREAKDOWN BY REGION 2011

Aircraft type	North America		Europe	
	Active	Parked	Active	Parked
Avro RJ	0	2	81	43
Bae 146	1	8	15	26
Bombardier CRJ200	605	90	59	17
Bombardier CRJ700	279	0	35	0
Bombardier CRJ900	139	6	75	0
Bombardier CRJ1000	0	0	23	0
Dornier 328JET	4	0	11	7
Embraer-170/-175	184	2	60	8
Embraer-190/-195	128	10	132	3
ERJ-135	28	42	11	4
ERJ-140	74	39	0	0
ERJ-145	439	0	69	28
Fokker 70	0	0	38	0
TOTAL	1,881	199	609	136

The largest CRJ-200 operators in North America in 2011 were Pinnacle Airlines (141 aircraft), ExpressJet (107), and Air Wisconsin (71).

There were also significant deliveries of newer, larger RJs to operators in North America from 2000 to 2011. This includes the Embraer E-Jet family and CRJ-700s and CRJ-900s.

Over 400 active CRJ-700s and CRJ-900s have been delivered to the North American market since 2000. The largest operators of CRJ-700s in 2011 in North America are SkyWest (92 aircraft), American Eagle (47), and ExpressJet (40). The largest operators of CRJ-900s are Pinnacle (57), Mesa (38), and SkyWest (21).

There are now more than 300 active Embraer E-Jets in North America (*see table, this page*). The largest operators of E-170/-175s are Shuttle America (67 aircraft), Republic Airlines (62), and Compass Airlines (42). jetBlue (51) is the largest operator of active E-190/-195s in

North America, closely followed by Air Canada with 45 active aircraft.

The RJ fleet in Europe has grown by 24.3%, or about 120 aircraft. Similarly to North America, deliveries of newer, larger RJs contributed to this growth. These satisfied increased demand, and replaced older generation types, such as the Fokker 100 and BAe 146.

The most numerous RJ in service in Europe in 2011 was the Embraer E-Jet family, with 132 active E-190/-195s and 60 active E-170s/-175s in service. Lufthansa Cityline (24 aircraft) and KLM Cityhopper (22) are the largest operators of E-190/-195s in Europe. LOT Polish (21) and Regional (Air France) (13) were the largest operators of E-170/-175s in Europe in 2011.

The Bombardier CRJ family was the next most numerous RJ type in Europe in 2011, with 59 active CRJ-200s, 35 active CRJ-700s, 75 active CRJ-900s, and 23 active CRJ-1000s. These are mainly operated by regional subsidiaries such as

NORTH AMERICAN & EUROPEAN MARKETS BY AIRCRAFT TYPE 2000-2011

Aircraft type	2000 Ops	2000 Seat capacity	2000 Av. a/c size	2000 % Ops	2000 % Seat cap.	2000 Av. stage length (nm)	2011 Ops	2011 Seat capacity	2011 Av. a/c size	2011 % Ops	2011 % Seat cap.	2011 Av. stage length (nm)
NORTH AMERICA:												
Turboprop	4,234,074	117,514,422	28	34.9%	10.6%	157	1,889,122	60,290,625	32	19.0%	6.5%	171
Regional Jet	1,245,522	68,257,582	55	10.3%	6.2%	387	3,375,127	191,460,373	57	33.9%	20.7%	475
Mainline Narrow	6,320,816	839,524,737	133	52.1%	76.0%	695	4,602,823	652,082,693	142	46.2%	70.6%	875
Mainline Wide	333,615	79,703,768	239	2.7%	7.2%	1264	85,277	19,683,397	231	0.9%	2.1%	1,495
EUROPE:												
Turboprop	1,666,583	76,279,898	46	30.3%	13.1%	211	1,068,662	58,692,619	55	16.7%	7.1%	250
Regional Jet	939,673	68,945,812	73	17.1%	11.8%	378	1,033,250	80,795,417	78	16.2%	9.8%	424
Mainline Narrow	2,805,590	413,782,122	147	50.9%	71.0%	648	4,248,973	673,818,983	159	66.6%	82.0%	760
Mainline Wide	96,764	24,162,706	250	1.8%	4.1%	724	29,719	8,078,929	272	0.5%	1.0%	1,008

Air Nostrum (33 CRJ-200s and 10 CRJ-1000s), Lufthansa Cityline (20 CRJ-700s and 12 CRJ-900s), and Brit Air (13 CRJ-200s and 15 CRJ-700s).

Turboprop market

In both North America and Europe, the number of operations conducted by turboprops decreased from 2000 to 2011.

Turboprop operations in North America have decreased by the largest factor; decreasing from about 4.2 million operations in 2000, to 1.9 million in 2011 (*see table, this page*).

In 2000, 34.2% of all operations in North America were turboprops, yet this figure had decreased to 19% by 2011 (*see table, this page*). This is explained by the fact that many North American regional carriers were phasing out their turboprop fleets during the decade in favour of 35- to 50-seat RJs, particularly at the start of the 2000s.

The turboprops that remain in North America are also larger, with an average seat capacity of 32 in 2011 compared with 28 in 2000 (*see table, this page*). Turboprops delivered from 2000 to 2011 were of a higher gauge; in particular the Bombardier Dash 8-Q400 and the ATR72.

A similar picture is seen for turboprops in Europe. Turboprop operations declined from about 1.6 million in 2000 to 1.07 million in 2011 (*see table, this page*).

In 2000, turboprops accounted for 30.3% of operations, whereas by 2011 they accounted for 16.7%. Similar to North America, average aircraft size for turboprops also increased in Europe, from 46 seats in 2000 to 55 seats in 2011 (*see table, this page*), again due to deliveries of higher seat capacity turboprops.

One reason why turboprops have declined since 2000 is the general passenger preference for jets. "From the passenger viewpoint, turboprops are still

noisier and have more vibrations in the cabin, with the perception of higher turbulence levels," says Yugo Fukuhara, director of marketing at Mitsubishi Aircraft Corporation. "Turboprops are also slower than jets, and are perceived to be less comfortable for passengers, particularly on a longer flight."

Despite the trend of decreasing turboprop use in both North America and Europe, and general passenger preferences for jets ahead of turboprops, the turboprop market is showing signs of stabilisation and recovery. "Passengers are changing their minds about turboprops," says Bagnato. "When they fly the new-generation turboprops, such as the ATR72-600, passengers experience many developments in terms of improved comfort, such as larger seats, more overhead bin capacity and substantial reductions in noise and vibrations."

Philippe Poutissou, vice president of marketing at Bombardier, echoes these sentiments. "In 2000, a jet implied a better passenger experience, but these perceptions are now outdated. Passengers are realising that modern turboprops offer comparable levels of comfort to a jet, and can even exceed it. One example is Porter Airlines even offering a premium service on its Q400 fleet," says Poutissou.

RJ market development

RJs, however, show different market development between North America and Europe.

In Europe, the number of RJ operations and capacity increased in absolute terms, yet in percentage terms their number of operations and capacity share of the market decreased.

In 2000, about 940,000 operations and 69 million seats were supplied by RJs in Europe (*see table, this page*). By 2011, this had increased to 1.03 million RJ operations and 80.7 million seats (*see table, this page*).

In terms of percentage share, however,

RJ operations in Europe accounted for 17.1% of total operations in 2000, which decreased to 16.2% in 2011. Total capacity share of RJs in Europe decreased from 11.8% in 2000 to 9.8% in 2011 (*see table, this page*).

The reason why capacity share for RJs fell in Europe during this period can be attributed to the rapid increase in mainline narrowbody operations. Low-cost carriers (LCCs), such as Ryanair and easyJet, expanded rapidly during the decade, and took delivery of a large number of narrowbody jets like the 737-800 and A319/A320.

With the lack of scope clauses in Europe, regional aircraft fleets were not limited to a particular size, so 50-seat RJ deliveries did not proliferate as they had in North America.

Also, in Europe, carriers still use many mainline jets on point-to-point routes between two smaller airports, compared with North America. For example, 3,458 low-density or small point-to-point routes in Europe were operated by mainline jets in 2011, compared to just 336 routes in North America (*see table, this page*). This indicates that passenger demand is higher for small point-to-point routes in Europe than in North America, where the hub-and-spoke system is still dominant.

In North America, therefore, RJ usage increased substantially from 2000 to 2011. In 2000, RJs accounted for 10.3% of all flight operations, 6.2% of seat capacity, 1.25 million operations and 68 million seats (*see table, this page*). By 2011, operations had increased to about 3.4 million, or 33.9% of all operations; and 191.5 million seats of capacity, which is equivalent to a 20.7% share of market capacity (*see table, this page*). This represents an increase in the use of RJs by a factor of three.

Two factors are responsible for the increase in the use of RJs in North America during this period. The first is that RJs are more suited to the North

NORTH AMERICA & EUROPE MARKET COMPOSITION BY AIRCRAFT TYPE 2000-2011

Aircraft type	2000 Routes	2000 Ops	2000 Seat capacity	2000 Average stage length (nm)	2011 Routes	2011 Ops	2011 Seat capacity	2011 Average stage length (nm)
NORTH AMERICA:								
Turboprop only	3,374	2,894,370	71,569,010	145	2,052	1,349,317	34,703,994	159
Regional Jet only	445	385,425	20,857,937	514	1,520	1,494,774	79,055,262	493
Turboprop & Regional Jet	338	693,381	28,249,894	246	385	612,914	30,542,434	219
Jetliner only	2,992	5,084,691	718,765,068	943	2,660	2,587,515	382,902,965	1,086
Jetliner & Turboprop	287	865,368	64,807,780	197	109	147,025	9,359,672	296
Jetliner & Regional Jet	506	1,171,547	123,442,691	492	1,181	3,181,222	337,304,421	612
Jetliner & Turboprop & Regional Jet	302	1,039,245	77,308,039	219	166	580,316	49,654,224	283
EUROPE:								
Turboprop only	2,051	919,438	37,856,524	193	1,729	583,902	27,730,497	236
Regional Jet only	550	247,476	18,072,469	475	806	266,813	19,410,568	479
Turboprop & Regional Jet	539	489,784	26,422,139	278	283	173,485	11,457,411	327
Jetliner only	2,848	1,602,766	252,180,209	836	9,209	2,634,517	438,702,252	860
Jetliner & Turboprop	362	462,058	43,082,111	253	487	374,928	37,544,463	301
Jetliner & Regional Jet	749	1,069,636	134,319,125	479	1,326	1,668,672	214,864,414	503
Jetliner & Turboprop & Regional Jet	397	717,452	71,237,961	246	396	678,259	71,676,119	271

American market due to the dominance of the hub-and-spoke network system, which is operated by most major US airlines, particularly the legacy carriers such as American Airlines, Delta, United and US Airways. This means airlines want to channel passengers through their major hubs to their final destination. RJs, therefore, provide capacity on lower-density routes serving hubs, routes to and from secondary hubs, and in markets serving smaller regional airports.

“To provide a consistent feed of passengers to an airline’s hub, a high frequency service is required,” says Poutissou. “High frequency services on feeder routes require smaller aircraft. RJs are also an effective network builder, bringing in passengers from lower demand regional airports that do not justify larger, mainline jets, which is why RJs have proved particularly popular in North America.”

The second reason for the large RJ growth in North America is the reduction or relaxation of pilot union scope clauses. “Scope clauses are one of the biggest influences on the regional market,” says Bagnato. “They limit the number of aircraft of a particular size that can be operated by a regional partner. This includes maximum take-off weight (MTOW) and seat capacity limits that can be operated within an airline system.”

Strong pilot unions in the US created pilot scope clauses in order to protect mainline pilots from certain routes being transferred to regional partners. Ten to 15 years ago, this forced many airlines in the US to be restricted to aircraft of 50 seats or fewer, which is why there were so many 50-seat RJs in the subsequent decade. It is also why about 75% of the

active global 50-seat RJ fleet is in North America. “The ‘magic number’ of aircraft seats in most of the airlines’ pilot union scope clauses was 50 in the past,” notes Fukuhara.

Over the past decade, there have been several pilot union scope clause renegotiations by major carriers with their pilot unions, which have resulted in scope clauses being relaxed. This has allowed airlines to operate larger RJs such as the Bombardier CRJ-700 and CRJ-900, as well as the Embraer E-jet family. “For example, Delta is currently negotiating with its pilot union to allow another 70 units of 75-seat RJs,” says Chiessi. “Furthermore, American Airlines, under Chapter 11, is renegotiating with its pilot union to introduce a sizeable number of 70-80-seat jets. The potential relaxation of scope clauses for Delta and American will also trigger the merged United to relax the current Continental contract, allowing them to operate larger RJs.

“In the short term, it is expected that all legacy carriers will deploy about 60% of their regional capacity in the 70-75-seat RJ segment,” continues Chiessi. “This could reach 70% in the mid- to long-term, providing much-needed flexibility and efficiency improvements to airlines.”

Efficiency improvement is another key reason why airlines in North America and Europe are moving towards larger RJs. “50-seat RJs were conceived when yields were higher and crude oil prices lower,” says Poutissou. “Since then, fuel prices have risen sharply, and passenger fare expectations have been lowered by competition from the LCCs, making it difficult to operate 50-seat RJs profitably.”

Operating larger RJs offers an airline lower seat-mile costs, so it is easier to operate them profitably. Added to this has been some consolidation among major airlines in North America and Europe. The major network expansions seen earlier in the decade have therefore not continued.

This means, for example, that in many cases two 50-seat RJ frequencies on a route in 2000 would be transferred to one frequency on a larger 70-90-seat RJ by 2011. Such a change often allows the airline to operate such a route more profitably.

Larger RJs have also been used to ‘right-size’ routes from larger, mainline narrowbody jets. Particularly in North America, an airline may have only had the choice of operating a 50-seat RJ or the smallest mainline narrowbody, which may have had a capacity of 120 seats, leaving a gap of 70 seats. This made it hard to optimise service frequencies and seat capacity. Larger RJs allow this optimisation.

Nevertheless, there will still be a market for 50-seat RJs. “Small-capacity RJs will continue to play an important role in the US hub-and-spoke system and keep lower-density routes serving small communities connected via one-stop hubs to major cities in the US and globally,” says Chiessi.

Poutissou elaborates on this: “In North America, there is still a market for about 500 50-seat RJs to serve niche markets, which have low demand, yet still command a high yield”.

Route networks

There are several different route types in an airline’s network. There are routes

between two major hubs, between a major hub and a secondary hub, and between a major hub to regional airports.

Airlines also operate routes between two secondary hubs, and from secondary hubs to regional airports, and finally between regional airports. Services between smaller regional airports are usually classified as point-to-point routes, while routes between a regional airport and a hub (both major and secondary) are usually classified as feeder routes.

“Both RJs and turboprops are primarily deployed as feeder aircraft, linking low- and medium-density city-pairs to a major hub,” says Chiessi. “Both RJs and turboprops are mainly used in point-to-point flights. Turboprops are concentrated in short-haul markets, particularly below 270nm. RJ missions are mainly hub-feeder, development of secondary hubs and longer point-to-point routes.”

Turboprops are often operated on the shortest routes. For those routes operated by turboprops only, the average stage length in the whole of the North American route network was 145nm in 2000 and 159nm in 2011 (see table, page 20).

Turboprop-only routes were also the shortest in the European market, averaging 193nm in 2000, and 236nm in 2011 (see table, page 20).

The average stage length for turboprops has therefore increased

slightly in both markets. This is mainly due to turboprops taking over some of the shorter routes that were operated by RJs as a consequence of increased fuel prices. Turboprops with higher cruise speeds were also delivered in the 11-year period, which has helped them replace RJs on some routes.

“New-generation turboprops, such as the Q400, have average stage lengths about 50-60nm longer than older generation turboprops,” says Poutissou. “This is because the new generation turboprops are faster and can remain competitive with jets on longer sectors than slower turboprops.”

This trend is reflected in the routes that turboprops now operate in North America and Europe. In both regions, turboprops are almost exclusively used on flights from small, regional airports. This is because they are not operated on hub-to-hub routes, and only minimally on routes between a hub and secondary hub.

Turboprops are used primarily on point-to-point routes linking two regional airports. For this type of route, 66.6% were operated only with turboprops in North America in 2011, and 60.1% in 2000 (see table, page 20). The equivalent figure in Europe is 62.5% of point-to-point routes using just turboprops in 2011, which compares to 57.5% in 2000 (see table, page 20). Utilisation of turboprops on regional markets has

therefore increased.

Turboprops are also used as feeders from regional airports to both large and secondary hubs, with these feeder routes accounting for almost all the remaining turboprop-only routes for North America and Europe in both 2000 and 2011.

When used in conjunction with RJs and mainline jetliners, turboprops provide capacity during periods of low demand. To make best use of their efficiency, turboprops tend to be added to those RJ and mainline jetliner routes of shorter stage lengths. For example, in North America in 2011, average stage length of routes operated by both turboprops and RJs was 219nm, while it was 296nm for those routes with turboprops and mainline jetliners (see table, page 20).

Route deployment for RJs differs from that for turboprops. In North America in 2011, for routes that were only operated by RJs, 62.9% were between a large hub and regional airport. This is an increase from 54.2% in 2000 (see table, page 20), because airlines in North America have used RJs for network expansion from major hubs during the decade. This confirms an RJ's status as primarily a feeder aircraft. Average stage length for RJs in North America decreased from 514nm in 2000 to 493nm in 2011 (see table, page 20). This illustrates that RJs are being used on some shorter routes, and in some cases to

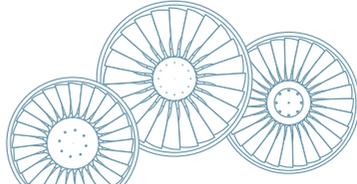


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ROUTE TYPES OPERATED IN NORTH AMERICAN & EUROPEAN MARKETS 2000-2011

Aircraft type	2000 Hub to hub	2000 Hub to sec.	2000 Hub to reg.	2000 Sec. to reg.	2000 Sec. to sec.	2000 Reg. to reg.	2011 Hub to hub	2011 Hub to sec.	2011 Hub to reg.	2011 Sec. to reg.	2011 Sec. to sec.	2011 Reg. to reg.
NORTH AMERICA:												
Turboprop (TP) only	0	14	802	519	12	2027	0	14	422	241	8	1367
Regional Jet (RJ) only	2	44	241	119	12	27	27	133	957	305	84	14
TP & RJ	2	18	185	118	4	11	6	25	270	63	9	12
Jetliner (JL) only	422	815	772	470	322	191	263	557	768	490	246	336
JL & TP	19	24	84	96	18	46	2	0	16	25	2	64
JL & RJ	48	147	171	77	56	7	203	384	445	64	85	0
JL & RJ & TP	17	34	154	64	28	5	21	41	66	21	13	4
EUROPE:												
Turboprop (TP) only	0	18	445	392	17	1,179	0	0	307	325	16	1,081
Regional Jet (RJ) only	6	52	156	152	43	141	0	13	278	183	23	309
TP & RJ	2	30	185	136	29	157	0	2	93	82	10	96
Jetliner only	140	339	753	833	161	622	177	547	1,878	2,791	358	3,458
JL & TP	3	18	140	95	11	95	2	20	88	169	28	180
JL & RJ	106	209	187	117	91	39	130	258	453	247	106	132
JL & RJ & TP	13	68	159	79	43	35	8	60	157	94	28	49

Note: Hub = Large hub, Sec. = Secondary hub, Reg. = Regional airport

replace turboprops.

In Europe, however, routes operated with just RJs were more evenly split between routes from a major hub to a regional airport, from a secondary hub to a regional, and on regional-to-regional services. This pattern did not change much from 2000 to 2011.

The average stage length of RJ-only routes in North America remained consistent through the decade at 475nm in 2000, to 479nm in 2011 (see table, this page).

In both regions, the average stage lengths of RJ-only routes fell neatly between the average stage lengths of routes operated solely with turboprops and mainline jetliners. For example, in North America in 2011, RJ-only routes had an average stage length of 493nm, compared to 159nm for turboprops and 1,086nm for mainline jetliners (see table, this page).

RJs also provided additional capacity on shorter routes which had some capacity provided by mainline jets. This is demonstrated by the fact that average stage lengths for routes operated by both RJs and mainline jets were shorter than the average stage length of routes operated by mainline jets only. For example, mixed mainline and RJ routes had an average stage length of 612nm in North America in 2011, compared to 1,086nm for mainline only (see table, this page).

Future

With airlines increasingly looking to 'right-size' routes, lower operating costs and find higher efficiencies, the outlook for both turboprops and RJs is good.

This will also involve several new airliners to the RJ market, including the COMAC ARJ, Sukhoi SSJ100, and the Mitsubishi RJ.

Relatively strong deliveries are expected for turboprops over the next 10–20 years. "In the 50-to 90-seat market, we estimate there will be a demand for more than 3,000 turboprops over the next two decades," says Bagnato. "This should represent roughly two-thirds of the global demand for this seat segment."

Other manufacturers anticipate demand for about 1,000 new turboprops in the next 10 years. "It is expected that 1,065 turboprops will be delivered in the next decade worldwide," says Chiessi. "Asia Pacific, Europe, and North America represent one-third each of the 10-year demand."

This demand will mostly be for larger turboprops as airlines look to lower seat-mile costs to improve profitability. "70-seat turboprops will have a 75% capacity share in the future, with the remaining 25% being 50-seat turboprops," predicts Fukuhara.

Deliveries of RJs in the next decade are expected to exceed those of turboprops. "There will be a global requirement for 1,320 RJs in the 61- to 90-seat segment over the next 10 years," says Chiessi. "North America represents 40% of future demand, driven by scope clause relaxation and a need for greater efficiency and lower operating costs. This is followed by Europe and China with 17% each.

"In the upper category (jets from 91-120 seats), the world requirement over 10 years will be almost 1,700 aircraft," continues Chiessi. "In this segment the

breakdown is North America with 21%, Europe with 26% and China and Latin America each with 15%."

There is one further issue, however, which is the dividing line between regional and mainline. In the US, this is clearer due to pilot union scope clauses categorising aircraft as regional or mainline.

In Europe, however, there are airlines that operate RJs in the 75-to 120-seat segment as mainline jets. For example, Finnair and LOT Polish Airlines operate their Embraer E-Jets as mainline, not regional, jets. This therefore makes it difficult to classify predicted future deliveries in this segment as either part of the RJ market, or part of the mainline jet market.

One particular example of this classification difficulty is the Bombardier CSeries. "The CSeries will be the most optimised aircraft to serve the 100-150-seat market," says Poutissou. "All the characteristics of the CSeries in terms of systems and amenities on-board are more similar to a narrowbody jet than an RJ. It is for the operators to decide whether to use it as a mainline jet, or regional." The CSeries will be used as a mainline jet in North America, but in Europe the situation is not as clear. For example, Swiss has ordered the CSeries to replace its Avro RJs, which are currently being operated on regional routes.

Despite this grey area, the market for turboprops and RJs in both North America and Europe looks set to remain strong. [AC](#)

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