Aircraft with 30-50 seats used to make up the core of regional fleets, but in recent years they have been superseded by 70-seat turboprops and 70-plus-seat RJs. Nick Preston considers levels of demand and potential markets for 30-seat and 50-seat types.

Is there still a market for aircraft with 50 seats or less?

Aircraft with 30-50 seats were a focal point of the regional commuter market throughout the 1980s and into the 1990s. More recently the number of in-service types in this size segment has declined. Operators have gravitated towards the latest generation of 70-seat turboprops and large regional jets (RJs) with 70 seats or more. Only one commercial aircraft remains in production in the 30- to 50-seat segment.

Aircraft Commerce has examined the extent of current and potential future demand for 30- to 50-seat aircraft. The in-production and secondary market options are identified, along with any potential for new aircraft programmes. Fleet development and airline schedule trends are analysed for three of the largest global regions. This article identifies a number of routes suited to 30- to 50-seat aircraft.

Market definition

Aircraft capacity in the regional passenger segment varies from smaller types with 19 seats, to the largest RJs with more than 100.

This article focuses on aircraft with a capacity of 50 seats or fewer, and on 30- to 50-seat aircraft in particular, with 19-seat types excluded. In many cases these smaller utility aircraft are used to operate routes that no other aircraft are capable of serving, including some publicly subsidised sectors. Some 30- to 50-seat aircraft will also be used to serve subsidised airport-pairs with challenging operational conditions, but these are more likely than 19-seat types to be used on sectors where their capacity and operating economics are the defining fleet selection criteria.

The 30- to 50-seat segment broadly falls into two subcategories of 30-seat aircraft, and 50-seat aircraft, as there are no types with intermediate seat capacity of 40 seats.

30-seat aircraft

In this analysis, 30-seat aircraft are categorised as those with a typical maximum capacity of 29-37 passengers.

The 30-seat market has, historically, been dominated by turboprops, but there are several RJs in this capacity segment.

Turboprop types range in size from the 29-seat BAe Jetstream 41 to the Dash 8-100 and Dash-200, subsequently re-branded by Bombardier as the Q100 and Q200. The Q100 and Q200 can accommodate 37-39 seats. They have been grouped in the 30-seat segment, as their typical capacity is closer to other 30-seat types than it is to most 50-seat aircraft.

Other 30-seat turboprops that have seen service over the past 25 years include the Dornier 328, Embraer 120 Brasilia, Shorts 330 and 360 and the Saab 340.

According to Flightglobal's FleetsAnalyzer there are 589 30-seat turboprops still in passenger service, including: 188 Saab 340s, 163 Q100s, 79 EMB-120s, 58, Q200s, 52 Jetstream 41s, 38 Dornier 328s, nine Shorts 360s, and several Gulfstream 1s.

There have only been two 30-seat RJ types in service over the past 25 years: the 37-seat ERJ-135 and the Dornier 328 Jet which can typically accommodate 32 passengers. Both types were introduced in the 1990s. There are currently 52 ERJ-135s and 27 Dornier 328 Jets in active passenger service.

There are no 30-seat aircraft in production. In 2015 a new project was announced to manufacture modernised versions of the Dornier 328 turboprop and 328 Jet. The aircraft would be manufactured by TRJet, a Turkish aviation and aerospace corporation founded by Sierra Nevada Corporation (SNC). Under the new programme the Dornier 328 turboprop would become the TRP328 while the jet variant would be known as the TRJ328.

The business case for the TRJet programme is that there are a number of domestic Turkish routes serving secondary cities that require aircraft in the 30-seat segment. *Aircraft Commerce* was unable to confirm the latest status of the TRJet programme and when manufacturing could begin. This has been delayed, but according to TRJet the programme remains valid. It was not possible to confirm the extent of the modifications that would take place to the original Dornier 328 turboprop and jet designs, with the expection of the previously announced Rockwell Collins Fusion flightdeck system and upgrades to the Pratt and Whitney (PW) engines.

50-seat aircraft

For the purposes of this analysis 50-seat aircraft are categorised as those that can accommodate 38-50 passengers.

In the 1980s and early 1990s this capacity segment consisted almost entirely of turboprops. From the mid 1990s 50-seat RJs began to increase in number before going on to eclipse turboprop sales in this market *(see table, page 19)*.

Over the past 25 years active 50-seat turboprops have ranged from older 1960s designs, including the Convair 580, Fokker F.27 and Hawker Sidley (HS) 748, to more modern types including the ATR 42, Dash 8-300 (Q300), Fokker 50, and Saab 2000.

There are 481 50-seat turboprops in active passenger service, including 194 ATR 42s, 176 Q300s, 57 Fokker 50s, 38 Saab 2000s and a small number of Dash 7s, Convair 580s and F.27s.

The 50-seat RJ market has been dominated by the CRJ100/200 series and the ERJ-140 and ERJ-145. The CRJ100/-200 and ERJ-145 all accommodate up to 50 seats while the ERJ-140 is typically configured for 44 passengers.

There are 970 50-seat RJs still in passenger service, including 477 CRJ200s, 448 ERJ-145s, 35 CRJ100s

ACTIVE REGIONAL AIRCRAFT FLEET 1992 TO 2016

Aircraft type	1992	1998	2004	2010	2016
30-seat turboprop	979	1,279	914	784	600
30-seat RJ			156	82	79
50-seat turboprop	847	874	756	630	481
50-seat RJ	3	356	1,613	1,522	1,010
70-seat turboprop	191	297	389	707	1,120
70+ seat RJ	454	743	790	1,642	2,259
Total	**2,474**	**3,549**	**4,618**	**5,367**	**5,549**
% 30-seat	40%	36%	23%	16%	12%
% 50-seat	34%	35%	51%	40%	27%
% 70+ seat	26%	29%	26%	44%	61%

Source: Flightglobal FleetsAnalyzer
Notes: Aircraft grouped into size categories by Aircraft Commerce. Western types only with exception of SSJ100.

and 10 ERJ-140s.

The ATR 42 is the only 50-seat aircraft programme that remains in production. The basic design has undergone a number of modifications since the first ATR 42 entered service in 1985. The original ATR 42-300/-320 model series was superseded by the -500 series in 1995. The latest ATR 42-600 series entered service in 2012, and it is this version that remains in production. The ATR 42-600 can accommodate up to 50 seats and features a number of design modifications and improvements over earlier series models. These include later generation PW127M engines, with improved hot and high performance.

There are 29 ATR 42-600s in active service and two in storage. There are a further 29 ATR 42-600s on firm order as of 26th April 2017.

Bombardier and Embraer have both ceased production of 50-seat RJs in favour of their 70 plus-seat jet programmes, so there are no 50-seat RJs currently in production.

Demand trends

General global demand trends for Western-built 30- to 50-seat aircraft have been analysed. More detailed trends have also been identified for three of the largest regional air traffic markets. In both cases, fleet data from 1992 to 2016 have been summarised at six-year intervals, to tie in with the available schedule data. Fleet trends have been analysed from 1992 onwards, as this was when the first 50-seat RJs began to enter service.

A more in-depth focus on the three largest regional markets also includes an analysis of airline schedules, using data provided by Flightglobal Schedules. The earliest schedule data available to *Aircraft Commerce* is from 2004. This has been compared to schedule data for 2016 to identify trends in the number of routes suitable for 30- to 50-seat aircraft.

General demand

The fleet of active 30- to 50-seat aircraft has been declining for a number of years. From 2004 to 2016, the number of in-service 30- to 50-seat passenger aircraft has decreased by more than one-third *(see table, this page)*. During this period the 30-seat and 50-seat segments have both seen a 37% reduction in their active fleets, while the number of turboprops and RJs with 70 seats or more has increased by 187%, indicating a shift towards larger aircraft.

In 1992 there were 979 30-seat aircraft in service, all of which were turboprops. By 2016 the number of active 30-seat aircraft had fallen to 679, with turboprops still accounting for 88% of the fleet. During this period some notable changes included the introduction of 30-seat RJs in the late 1990s and the phasing-out of older aircraft including the Shorts 360.

The 50-seat aircraft fleet has changed considerably over the past 25 years. In 1992 there were 850 active 50-seat aircraft, most of which were turboprops. The fleet grew rapidly in the late 1990s and early 2000s, due to the introduction of a large number of RJs from the CRJ100/200 series and ERJ families. These aircraft were particularly popular in the US market where regional carriers used them to provide feeder services on behalf of the major airlines. This resulted in a 179% increase in the 50-seat aircraft fleet from 1992 to 2004. By this point RJs accounted for 68% of the 50-seat fleet. The rise of the 50-seat RJ was eventually halted, partly due to a relaxation of pilot scope clause restrictions at the US major airlines. This led to airlines replacing their 50-seat aircraft with larger 70-seat types. From 2004 to 2016 the number of active turboprops and RJs in the 50-seat segment decreased by 36% and 37%. At the end of 2016 RJs still accounted for 68% of the 50-seat fleet.

"The decline in demand for aircraft with 50 seats or fewer has been evident for about 10 years," says Angus von Schoenberg, chief investment officer at regional aircraft leasing specialist TrueNoord. "This trend was accelerated by the high jet fuel prices experienced up until a year or so ago. The relaxation of US scope clauses meant that the big US operators could upscale their regional feeder services to more economical types with 70 seats or more."

ATR and Embraer acknowledge there has been an overall decline in demand in for aircraft with 50 seats or fewer.

"If we look at regional aviation globally, there has been a decline in demand for 50-seat aircraft since a peak in the mid 1990s," says John Moore, head of global sales at ATR. "Bombardier is no longer manufacturing Q300s or CRJ200s, and Embraer has ceased production of the ERJ-145."

"The demand for new aircraft with 50 seats or fewer has declined, driven by US carriers removing 50-seat RJs from their networks for a little over 10 years," claims Rodrigo Silva e Souza, marketing vice president, Embraer Commercial Aviation at Embraer. "Several factors contributed to this, starting with a number of carriers entering Chapter 11 bankruptcy protection in the early 2000s, followed by airline consolidation. In addition, a relaxation in pilot scope clauses, which have been shaping the US landscape since the 1990s, combined with high fuel prices and a pilot shortage, has led to airlines upgauging to 76-seat RJs with dual-class cabins."

"The 30-seat market is even more restricted than the 50-seat market," claims Schoenberg. "On a per-seat basis, 30-seat aircraft are maintenance- and fuel-intensive and few operators are making a success of them in today's market. BMI Regional in the UK is a relatively rare example." Von Schoenberg believes there is a very limited market for new 30-seat aircraft. "The economics of small turboprops are challenging," he says. "Most operators flying them would struggle to afford the capital cost of new models."

New v secondary market

ATR and Embraer both believe there will be future demand for aircraft with 50

In the 1980s and early 1990s turboprops accounted for the majority of the 30-seat and 50-seat fleets. Shorts 360s were a popular type in Europe and the US.

seats or fewer, despite the global decline in active 30-seat and 50-seat fleet numbers. ATR believes there will be demand for new aircraft in the 50-seat segment. In contrast, Embraer emphasises the potential demand for used types in both the 30-seat and 50-seat segments.

"The market may be smaller, but there is clearly demand for our 50-seat aircraft," says Moore at ATR. "Our market forecast suggests there will be a need for more than 600 new 50-seat turboprops from 2016 to 2035. "We believe the advantages of the ATR 42-600 will ensure it continues to present an attractive business case to airlines.

"The ATR 42-600 is the ideal solution for many operators and markets which do not require capacity in excess of 50 seats, or which have specific airfield performance requirements," continues Moore. "The 50-seat aircraft fleet is largely concentrated in mature markets in Europe, North America and Asia. These aircraft address various markets, of which 40% have limited potential for traffic growth. About 10% of these mature routes also have runway-length constraints, a barrier that can be overcome by using 50-seat turboprops.

"Future demand for ATR turboprops will come from replacement requirements and the creation and development of new routes from airports with challenging infrastructure," says Moore.

ATR sees future demand potential for the ATR 42-600 as a replacement candidate for ageing 30- and 50-seat turboprops and RJs. "Not every 50-seat turboprop can be upgraded to a 70-seater," says Moore. "Likewise 30-seat turboprops cannot all be replaced by 19-seat types. Older RJs are not a realistic alternative to ageing 30- and 50-seat turboprops, given their extra fuel consumption and spiralling maintenance costs. An ATR 42-600 can match the trip costs of an old 30-seat aircraft, whose maintenance costs have made the aircraft financially unsustainable. The ATR 42-600 can also stimulate traffic growth with 25% lower costs per seat. Our forecast includes demand for replacing ageing turboprop types, such as older ATR 42s, Q100s, Q200s, Q300s, Fokker 50s and Saab 2000s.

"We also believe there is a distinct possibility that carriers will seek to replace 40- to 50-seat RJs with the ATR 42-600 to optimise efficiencies and operating costs when they have to operate short distance sectors," says Moore. "With the higher fuel burn of RJs, it makes more sense for operators to choose turboprops, especially on sectors of below 300 nautical miles (nm).

"One in four ATR operators benefits from integrated fleets of ATR 42s and ATR 72s," says Moore. "The ATR 42 and ATR 72 have 85% parts commonality. Thanks to its size, the ATR 42 also has the ability to satisfy niche operational requirements including those related to oil and gas and natural resources contract flying."

Embraer believes that much of the 50-seat RJ replacement demand has already been met by new, larger aircraft, but acknowledges that there is still a gap for 30-seat and 50-seat types.

"The replacement of 50-seat jets has mostly been addressed by the addition of 76-seaters," says Silva e Souza. "Short-haul operations can drive demand for turboprops, but jet productivity is critical in the US hub-and-spoke system because of their overall operational efficiency and compatibility with narrowbody jets.

"There is room for commercial passenger aircraft with 50 seats or fewer," continues Silva e Souza. "This demand will, however, be absorbed by used aircraft in the secondary market. This is especially true in emerging markets where small aircraft types are critical to the development of regional aviation and improved connectivity."

Embraer admits there is still a need for 30-seat turboprops. "Since most small turboprop manufacturers have discontinued production in favour of larger types, the customer base for this class of aircraft is left with ageing fleets," says Silva e Souza.

"The gap is there and so is the need. The primary challenges come from a pilot shortage and the increasing operational costs related to issues, such as security and infrastructure that deeply affect this size of aircraft. Beyond that, demand will always vary depending on where we are in the replacement cycle for current aircraft in that segment and, of course, in which direction the jet fuel price is trending."

Embraer has no current plans to re-enter the 30- or 50-seat segments, but it does not rule out new developments in the future. "Embraer is always assessing the market to offer the best solutions," says Silva e Souza. "Realistically, we are deeply involved with bringing the E-Jets E2 family to market. We are, however, continuously talking to customers to understand their requirements. This, together with the availability of new technologies, will determine any new developments."

Regional demand

A more detailed consideration of demand trends for 30-seat and 50-seat aircraft can be provided by an in-depth analysis of three of the largest regional markets: North America, Europe and Asia Pacific.

Flightglobal schedule data is used to identify the number of airport pairs from each region that support average capacities suitable for 30-seat and 50-seat aircraft. A number of assumptions have been used to achieve this and the results should only be considered within this context.

For the purposes of this analysis,

TOP 10 30-SEAT AND 50-SEAT ROUTES IN NORTH AMERICA BASED ON ANNUAL CAPACITY IN 2016

30-Seat Airport Pairs	Origin Country	Destination Country	Seats	Flights	Average seats
Anchorage (ANC) - Kenai (ENA)	United States	United States	401,780	18,254	22
Kona, Hawaii (KOA) - Kahului, Maui (OGG)	United States	United States	387,409	11,568	33
San Juan, Puerto Rico (SJU) - St Thomas (STT)	United States	United States	326,487	11,368	29
Comox (YQQ) - Vancouver (YVR)	Canada	Canada	173,755	5,858	30
San Juan, Puerto Rico (SJU) - Saint Croix Island (STX)	United States	United States	168,916	5,356	32
Anchorage (ANC) - Homer (HOM)	United States	United States	128,016	3,600	36
Sept-Iles (YZV) - Quebec (YQB)	Canada	Canada	115,569	3,241	36
Philadelphia (PHL) - Wilkes-Barre/Scranton (AVP)	United States	United States	114,854	3,092	37
Deer Lake (YDF) - St. Johns (YYT)	Canada	Canada	114,686	4,352	26
Wabush (YWK) - Sept-Iles (YZV)	Canada	Canada	112,362	4,042	28

50-Seat Airport Pairs	Origin Country	Destination Country	Seats	Flights	Average seats
Chicago O'Hare (ORD) - Milwaukee (MKE)	United States	Unites States	485,400	9,896	49
Chicago O'Hare (ORD) - Green Bay (GRB)	United States	Unites States	272,852	5,566	49
Charlotte (CLT) - Roanoke (ROA)	United States	Unites States	262,135	5,369	49
San Francisco (SFO) - Ontario, CA (ONT)	United States	Unites States	255,257	5,407	47
Philadelphia (PHL) - Richmond (RIC)	United States	Unites States	250,777	5,182	48
Dallas Fort Worth (DFW) - Shreveport (SHV)	United States	Unites States	242,916	4,908	49
Charlotte (CLT) - Columbia (CAE)	United States	Unites States	238,457	4,863	49
Charlotte (CLT) - Augusta (AGS)	United States	Unites States	237,779	4,720	50
Washington National (DCA) - Cleveland (CLE)	United States	Unites States	231,310	4,608	50
Chicago O'Hare (ORD) - Peoria (PIA)	United States	Unites States	230,662	4,730	49

Source: Flightglobal schedule data
Notes:
1). Figures for each airport-pair include both directions of travel. Seat and flight numbers are therefore based on two-way capacity.
2). Only includes routes with sector length of 1,000nm or less and minimum frequency of 52 annual flights in each direction.

suitable average capacities are considered to be 20-37 seats for 30-seat aircraft and 38-50 seats for 50-seat types. Only two-way routes with at least one weekly year-round frequency are considered. It is acknowledged that there will be some additional demand for 30-seat and 50-seat types on multi-stop services not covered by this analysis.

Aircraft with 50 seats or fewer tend to be used on shorter sectors, so only those routes with lengths shorter than 1,000nm are considered here.

In some cases, certain airport pairs experience a directional imbalance in their average annual capacity, possibly due to additional one-directional specialist charters. Where the average capacity of an airport-pair is 38 seats or more in at least one direction, the route is classified as suitable for 50-seat aircraft.

There are examples in the analysis of routes operated by Q100s or Q200s which have 37-39 seats, and therefore straddle the capacity thresholds defined here. Although the Q100/200 is classified as a 30-seat aircraft, it was decided that any routes operated solely by these types in 39-seat configurations, should be deemed suitable for 50-seat types. This is because there are more 50-seat aircraft capable of serving this average capacity level than there are 30-seat types.

New routes are defined as those that had more than 52 annual flights in 2016, but fewer than an annual weekly frequency in 2004. The opposite definition applies to those routes considered as cancelled during this period.

North America

The North American market includes the US, Canada and Mexico and has historically been the largest base of demand for regional aircraft. At the end of 2016 there were 220 30-seat aircraft and 919 50-seat types in service in North America, accounting for 32% and 62% respectively of the active global fleets.

At the end of 1992 there were 667 30-seat and 292 50-seat types in service in North America. All of these aircraft were turboprops.

From 1992 to 2004 the active 30-seat fleet fell by 8% to 611 aircraft, and the number of in-service 30-seat turboprops decreased by 23%. This was partly offset by the introduction of ERJ-135s and Dornier 328 Jets. There were 97 active 30-seat RJs in North America by the end of 2004.

In contrast to the 30-seat segment, the active 50-seat fleet in North America grew by 373% from 1992 to 2004, due to the introduction of 50-seat RJs on regional feeder services in the US. From 1998 to 2004 alone, the fleet of active 50-seat turboprops more than halved, but the number of 50-seat RJs in service increased from 229 to 1,290.

The number of active aircraft in North America decreased in both the 30-seat and 50-seat segments from 2004 to 2016. The 30-seat fleet decreased by 64% during this period. This included a 62% reduction in 30-seat turboprops, and a 75% reduction in the smaller fleet of 30-seat RJs. The active 50-seat fleet decreased by one-third from 2004 to 2016. This included a 39% reduction in the number of 50-seat RJs, but a 48% increase in the modest 50-seat turboprop fleet. During the same period the number of 70-plus-seat RJs in North America increased from 267 to 1,127.

Scope clauses and consolidation

The US dominates the North American market. At the end of 2016 US-based operators accounted for nearly 78% of all active 30- and 50-seat aircraft in North America.

Two significant developments have occurred in the US market since the early 2000s: a relaxation in mainline pilot scope clauses; and airline consolidation. The change in scope restrictions has significantly contributed to the reduction in demand for 50-seat aircraft, but post-merger network rationalisation has also played a part in reducing the markets for both 30-seat and 50-seat types.

In the US, most regional flying is performed by partner carriers on behalf of the major airlines. These carriers typically operate feeder services between regional communities and mainline hubs. The regional carriers will use their own

In the 1990s 50-seat RJs, including the ERJ-145 and CRJ-100/200 series, entered service in increasing numbers. They quickly eclipsed turboprop sales, particularly in the US.

aircraft, operated under mainline airline branding. The three US majors' current regional brands are American Eagle, Delta Connection and United Express. Many regional carriers are independent, but some are wholly-owned subsidiaries of the mainline airlines.

US mainline pilot labour agreements contain scope clauses, designed to offer an element of job and salary security to mainline pilots by restricting the amount of flying that regional aircraft can carry out on behalf of the major carrier. Typical restrictions relate to the capacity and maximum take-off weight (MTOW) of the regional aircraft that can be operated, along with limits on the total number of regional aircraft that can be used. Scope clauses are more likely to apply to RJs than turboprops since RJs' operational capabilities are closer to mainline aircraft.

Scope clauses vary by individual airline, but there have been trends in the standard restrictions applied. The clauses have developed in parallel with the introduction of new, larger and more capable RJs. In 2000, standard limits restricted regional aircraft to an MTOW of 60,000lbs and a capacity of 50 seats. *(see An evaluation of the large regional jet market, Aircraft Commerce, February/March 2017, page 18).* In 2003 this increased to an MTOW of 80,000lbs and a capacity of 70 seats. The most recent change occurred in 2006 when the MTOW limit was increased to 86,000lbs and the maximum capacity was capped at 76 seats, resulting in a shift away from 50-seat towards 76-seat RJs.

Four major airline mergers have taken place in the US over the past decade. The consolidation trend began with the merger of Delta Air Lines and Northwest Airlines in 2008, followed by that of United Airlines and Continental in 2010. The low-cost carrier (LCC) Southwest acquired its smaller rival Air Tran in 2011, before American Airlines (AA) and US Airways merged in 2013. For the legacy mainline carriers, there is evidence that consolidation has led to rationalised route networks *(see The effect of mergers on US airline performance, Aircraft Commerce, June/July 2016, page 11).* Delta has significantly cut operations from pre-merger hubs at Cincinnati (CVG) and Memphis (MEM), while United no longer considers its pre-merger base at Cleveland (CLE) as a hub airport. This level of network rationalisation may have reduced the market potential for 30- and 50-seat feeder aircraft.

30-seat routes

The number of North American airport-pairs with an average capacity suitable for 30-seat aircraft fell from 393 to 191 from 2004 to 2016. This represents a 51% reduction in routes.

Some of this reduction can be explained by airlines introducing larger or smaller capacity aircraft on certain airport pairs. In other cases routes have been discontinued altogether.

In 2004, eight of the 10 largest operators of 30-seat aircraft in North America were US-based carriers. SkyWest had the largest fleet with 74 EMB-120s. The next largest operators were American Eagle (now Envoy Air operating under the American Eagle brand) with 39 ERJ-135s and 34 Saab 340s, Mesaba Airlines with 68 Saab 340s, Jazz with 46 Q100s and Piedmont Airlines with 33 Q100s and nine Q200s.

Some operators have exited 30-seat operations, while others have reduced their fleets. By 2016 SkyWest and Envoy Air had ceased operations with 30-seat aircraft focusing instead on 50-seat and 70-plus-seat RJs. Jazz and Piedmont still operate 30-seat turboprops, but have reduced their active numbers of these aircraft. Since 2004, Jazz has added 70-seat turboprops and 70-plus-seat RJs, while Piedmont has added 50-seat RJs.

Since 2004 a number of US hub airports have seen an increase in average capacity on some routes that were previously operated by 30-seat aircraft. The average capacity on some of these airport-pairs had grown to levels more suitable for 50-seat types, or even larger aircraft, by the end of 2016. Airports that saw the most routes follow this pattern include Delta's hub at Salt Lake City (SLC), AA's hub at Dallas Forth Worth (DFW) and United's hub at Denver (DEN). The number of affected routes was 11 at SLC, 10 at DFW and nine at DEN.

The majority of Delta's regional services from SLC are operated by SkyWest Airlines, which replaced EMB-120s with 50-seat CRJ100/200s, or 70-plus-seat RJs on a number of routes between 2004 and 2016. Some of AA's regional services at DFW were previously provided exclusively, or in part, by American Eagle Saab 340s. These have been replaced by 50-seat and/or 70-plus-seat RJ types since 2004. At DEN, average capacity increases from 30-seat aircraft to larger types can be attributed to EMB-120s and Q100s being replaced by 50-seat and/or 70-plus-seat RJs on United regional services.

Since 2004 a number of North American routes have seen their average capacity decrease from the 30-seat segment to 19 seats or fewer. At Pittsburgh (PIT) five routes were downgraded from 30-seat turboprops to smaller utility types from 2004 to 2016. This may have been a result of US Airways downsizing its operation at the airport during this period.

Hub closures appear to have been a factor in a number of 30-seat routes being discontinued completely since 2004. PIT has seen the most 30-seat routes cut, with 16 airport-pairs discontinued from 2004 to 2016, followed by MEM with 11. These airports have seen respective hub closures by US Airways and Delta.

Despite a decline in routes suitable for 30-seat aircraft, it is clear that a certain

Japan Air Commuter recently took delivery of its first ATR 42-600, the only aircraft type in production in the 30- to 50-seat segment. ATR has forecast a need for more than 600 new 50-seat turboprops globally from 2016 to 2035.

market still exists for these types in North America. The 191 airport-pairs identified as suitable for 30-seat types accounted for a total of 7.45 million seats and 245,909 flights during 2016. The US and Canadian domestic markets accounted for 54% and 40% of these seats respectively.

The hubs with the most 30-seat routes in 2016 were Anchorage (ANC) and Washington-Dulles (IAD), with 10 each, and Philadelphia (PHL) with nine.

The 30-seat routes with the largest available capacities in 2016 were all US and Canadian domestic services *(see table, page 22)*. The largest of these was the airport pair linking ANC and Kenai (ENA) in Alaska, which is operated by Ravn Alaska using Q100s.

A number of new 30-seat routes have also been introduced since 2004. The hubs with most new routes were IAD and Charlotte (CLT) with seven and five respectively.

50-seat routes

The number of North American airport-pairs with average capacities suited to 50-seat aircraft decreased by one-third during 2004-2016, from 749 to 503. Contributing factors included the introduction of larger or smaller aircraft on certain routes, which meant an increase or decrease in average capacity to levels no longer suitable for 50-seat types. Some routes are also no longer operated.

In 2004, the 10 largest North American 50-seat aircraft operators were all US-based carriers. Most 50-seat fleets were focused around RJs. The combined assets of ExpressJet Airlines and Atlantic Southeast Airlines accounted for the largest 50-seat fleet in North America in 2004. These airlines subsequently merged in 2011 to create the current ExpressJet. In 2004 the combined fleet of the two carriers accounted for 306 50-seat RJs including 214 ERJ-145s and 92 CRJ200s. The next largest operators were American Eagle (now Envoy) with 59 ERJ-140s and 88 ERJ-145s, Comair with 87 CRJ100s and 50 CRJ200s, SkyWest Airlines with 10 CRJ100s and 115 CRJ200s, and Pinnacle Airlines (now Endeavor Air) with 117 CRJ200s.

The number of 50-seat RJs operated by these carriers or their current incarnations generally decreased from 2004 to 2016, in parallel with scope clause developments. One exception to this rule is SkyWest Airlines, which increased its CRJ200 fleet by 37 aircraft. SkyWest has, however, also been adding 70-plus-seat RJs including CRJ700s, CRJ900s and E175s. Envoy and Endeavor Air have reduced the 50-seat fleets previously operated by American Eagle and Pinnacle Airlines in favour of 70-plus-seat RJs, while Comair has ceased trading.

The move towards larger 76-seat RJs in the US market has seen average capacities rise on many airport-pairs previously suited to 50-seat types. US hubs that have seen the most routes increase from average capacities suited to 50-seat types, to levels that require larger aircraft, include CLT (22 routes), IAD (20) and DFW (17). Other hubs with significant increases include New York-LaGuardia (LGA), (17), Houston (IAH), (15), New York-Newark (EWR) and JFK (14 each), and Chicago O'Hare (ORD), (13).

In many cases the average capacity on these routes now exceeds 50 seats because ERJ-145s and CRJ200s have been replaced, to a certain extent, by 76-seat RJs. There are also examples of mainline narrowbody types being introduced on former 50-seat routes. On a significant number of airport-pairs 50-seat RJs remain in service alongside larger types at reduced frequencies.

There are also North American routes that saw a reduction in seats from 2004 to 2016, to the extent that their average capacities would no longer be considered sufficient for 50-seat aircraft. PHL (5) has seen the most 50-seat routes follow this trend since 2004. It has seen 50-seat RJs removed from these five destinations, in favour of exclusive operations by Piedmont Airlines' 30-seat Q100/200 turboprops. These are operated on behalf of the post-merger AA.

In addition to capacity reductions, some previous 50-seat routes were cut altogether from 2004 to 2016. Unsurprisingly, the airports that saw the most cuts were those that have lost their mainline hubs status in recent years. CVG saw the most cuts (48 50-seat sectors) followed by CLE (30), PIT (21) and MEM (20).

Despite the obvious trend towards larger 76-seat aircraft, there were still 503 North American routes with average capacities suited to 50-seat aircraft in 2016. These accounted for 36.93 million seats and 772,843 flights. The US domestic market accounted for 79% of these seats alone.

"In the North American market, the number of ERJ operators has tripled from six to 18 since 2010," says Silva e Souza. "Some units are even back in service with first-tier regional airlines. AA subsidiary Envoy plans to pull an additional 37 ERJ-140s out of storage and put them back into service by end of 2017."

The hubs with the most 50-seat routes in 2016 were ORD (49), DFW (42), and IAH (31).

The 50-seat routes with the most capacity available in 2016 were all US domestic services *(see table, page 22)*. Three of the top 10 50-seat routes serve ORD. The two largest routes link ORD with Milwaukee (MKE) and Green Bay (GRB), and are operated by AA and United regional affiliates, mostly using 50-seat ERJ-145s or CRJ200s.

From 2004 to 2016 a number of new 50-seat routes were introduced in North

TOP 10 30-SEAT AND 50-SEAT ROUTES IN EUROPE BASED ON ANNUAL CAPACITY IN 2016

30-Seat Airport Pairs	Origin Country	Destination Country	Seats	Flights	Average seats
Munich (MUC) - Bern (BRN)	Germany	Switzerland	77,400	2,256	34
Aberdeen (ABZ) - Kirkwall (KOI)	United Kingdom	United Kingdom	67,932	1,998	34
Edinburgh (EDI) - (LSI) Sumburgh	United Kingdom	United Kingdom	62,764	1,846	34
Edinburgh (EDI) - Kirkwall (KOI)	United Kingdom	United Kingdom	61,880	1,820	34
Stockholm-Arlanda (ARN) - Jonkoping (JKG)	Sweden	Sweden	61,370	1,805	34
Inverness (INV) - Stornoway (SYY)	United Kingdom	United Kingdom	61,226	1,808	34
Stockholm-Arlanda (ARN) - Karlstad (KSD)	Sweden	Sweden	53,006	1,559	34
Aberdeen (ABZ) - Newcastle (NCL)	United Kingdom	United Kingdom	50,257	1,733	29
Aberdeen (ABZ) - Durham Tees Valley (MME)	United Kingdom	United Kingdom	50,044	1,668	30
Manchester (MAN) - Norwich (NWI)	United Kingdom	United Kingdom	47,802	1,542	31

50-Seat Airport Pairs	Origin Country	Destination Country	Seats	Flights	Average seats
Tromso (TOS) - Hammerfest (HFT)	Norway	Norway	192,738	4,942	39
Leknes (LKN) - Bodo (BOO)	Norway	Norway	162,981	4,179	39
Aberdeen (ABZ) - Norwich (NWI)	United Kingdom	United Kingdom	142,963	3,136	46
Svolvaer (SVJ) - Bodo (BOO)	Norway	Norway	129,987	3,333	39
Aberdeen (ABZ) - Sumburgh (LSI)	United Kingdom	United Kingdom	128,316	2,672	48
Trondheim (TRD) - Bronnoysund (BNN)	Norway	Norway	126,555	3,245	39
Stokmarknes (SKN) - Bodo (BOO)	Norway	Norway	124,449	3,191	39
Oslo (OSL) - Orsta/Volda (HOV)	Norway	Norway	122,967	3,153	39
Rome Fiumicino (FCO) - Pisa (PSA)	Italy	Italy	121,312	2,486	49
Oslo (OSL) - Forde (FDE)	Norway	Norway	119,340	3,060	39

Source: Flightglobal schedule data
Notes:
1). Figures for each airport-pair include both directions of travel. Seat and flight numbers are therefore based on two-way capacity.
2). Only includes routes with sector length of 1,000nm or less and minimum frequency of 52 annual flights in each direction.

America. The hubs with the most new 50-seat routes were DFW and ORD (20 each).

Europe

There were 113 30-seat aircraft and 137 50-seat types in service in Europe at the end of 2016, accounting for 17% and 9% of the respective global fleets.

At the end of 1992 there were 192 30-seat aircraft and 248 50-seat types in service in Europe. All but three of these aircraft were turboprops.

From 1992 to 2004 the 30-seat fleet decreased by 16% to 161 aircraft. This period saw the introduction of 30-seat jets and new 30-seat turboprops, including the Dornier 328 and Jetstream 41. There was also a reduction in active Shorts 360s and Saab 340s. In contrast, the 50-seat fleet in Europe increased from 248 to 576 aircraft, mainly driven by the introduction of 50-seat RJs.

The 30-seat and 50-seat fleets both decreased in size from 2004 to 2016. The number of active 30-seat aircraft contracted by 30%, with a reduction in both RJ and turboprop numbers. The 50-seat fleet contracted by 76% with a 72% decrease in active turboprops and an 81% reduction in RJs. During the same period the fleet of active 70-seat turboprops and 70-plus-seat RJs grew by 40%.

30-seat routes

The number of European airport-pairs with an average capacity suitable for 30-seat aircraft decreased from 200 in 2004 to 82 in 2016. This represents a 59% reduction. The main reasons were an increase in capacity by some operators on certain airport-pairs and the outright cancellation of a number of routes. There were also a small number of routes where the average capacity has fallen to levels more suitable for 19-seat aircraft.

In 2004, the largest 30-seat fleet in Europe was operated by Régional, one of the forerunners to HOP!, Air France's regional brand. Today, HOP! is based on an alliance of three airlines: Airlinair, Brit Air and Régional. In 2004 its equivalent 30-seat fleet comprised 22 aircraft, including 13 EMB-120s and nine ERJ-135s. The next largest 30-seat operators were Norwegian carrier Wideroe with 17 Q100s, UK-based Eastern Airways with 14 Jetstream 41s, and German-based Cirrus Airlines with 13 aircraft, including a mix of Dornier 328 turboprops and jets and Q100s.

From 2004 to 2016, the equivalent HOP! operators exited the 30-seat segment in favour of larger turboprops and/or RJs, while Cirrus Airlines ceased trading. Wideroe and Eastern Airways added larger 50- and/or 70-seat types, but also increased their active 30-seat fleets. Wideroe increased its Q100 fleet by six aircraft, while Eastern Airways added an additional Jetstream 41.

Norwegian airports saw the largest number of routes increase from average capacities suitable for 30-seat aircraft, to those potentially requiring larger types. Bodo (BOO) saw seven 30-seat routes increase to higher-capacity segments, while Trondheim (TRD) and Vadso (VDS) both had six routes following this pattern. This trend can be largely explained by an increase in the reported capacity of Wideroe's Q100 fleet. In 2004 this was reported as 37 seats, but in 2016 it had increased to 39 seats. Wideroe operates an extensive route network in Norway, including public service obligation (PSO) routes. On some airport-pairs it is the sole operator. Any change to its aircraft size will therefore have a major impact on a route's average capacity. This has resulted in many Wideroe routes increasing from an average capacity of 37 in 2004 to 39 in 2016. It is not certain if this involved a physical increase in the number of seats, or simply an adjustment in the reported capacity. It has already been established that this analysis considers any routes with 38 or more seats as suitable for 50-seat types, so these routes are no longer categorised as 30-seat markets, despite being operated by Q100s.

A small number of 30-seat routes saw reduced services from 2004 to 2016, which now makes their average capacities more suitable to 19-seat types. One example is the domestic French link between Bordeaux (BOD) and Rennes (RNS). In 2004 this was served by an Air France regional operator using EMB-120s. In 2016 Chalair Aviation is the sole operator with Beech 1900s.

A number of former 30-seat European routes were completely cut

50-seat RJs became popular with US regional airlines that deployed them on feeder services for the major mainline carriers. In recent years 50-seat RJs have been withdrawn from service in the US in favour of larger, 76-seat aircraft.

from the schedules from 2004 to 2016. The airports with the most 30-seat routes cancelled were Clermont-Ferrand (CFE) in France with six. CFE lost services to eight domestic points that were operated by EMB-120s on Air France regional services in 2004.

There is still some demand for 30-seat aircraft in Europe. The 82 suitable routes identified in 2016 accounted for 2.08 million seats and 67,091 flights.

The UK is the largest European market for 30-seat operations. UK domestic services accounted for 55% of the seats operated on 30-seat routes in Europe in 2016. Aberdeen (ABZ) in Scotland had the most 30-seat routes (8), followed by Bern (BRN) in Switzerland with seven, and Stockholm-Arlanda (ARN), Glasgow (GLA), and Newcastle (NCL) with six each. Scotland features prominently as a market for 30-seat operations due to services between GLA and Edinburgh (EDI) and the Highlands and Islands, which are operated by Loganair using Saab 340s, among other types. ABZ also supports 30-seat operations by Eastern Airways, which uses Jetstream 41s to link this centre for the North Sea oil and gas industry, to various domestic UK points.

Of the 10 largest 30-seat routes in 2016, seven are UK domestic services, three of which serve ABZ *(see table, page 26)*.

A number of new 30-seat routes have also been introduced in Europe since 2004. The airport that saw the most new 30-seat services is BRN with four. This was a result of Swiss operator SkyWork introducing new routes with Dornier 328 turboprops.

50-seat routes

The number of European routes with average capacities suitable for 50-seat aircraft decreased by 63% from 2004 to 2016. There were 473 50-seat routes in 2004, but this had fallen to 176 by 2016. The reduction in 50-seat routes was due to increases or decreases in capacity on some airport-pairs, along with route cancellations.

In 2004 the combined fleets of Airlinair, Brit Air and Regional (now operating as HOP!) accounted for the largest number of active 50-seat aircraft in Europe. The combined 50-seat fleet totalled 69 aircraft; including six Saab 2000s, 17 ATR 42s, 19 CRJ100s and 27 ERJ-145s. The next largest European 50-seat operators were Air Nostrum (53 aircraft) with five Fokker 50s, 19 Q300s and 29 CRJ200s, Lufthansa CityLine (43), with 29 CRJ100s and 14 CRJ200s and British Airways (BA) CitiExpress, (38) with 10 Q300s and 28 ERJ-145s.

By 2016, HOP! and Air Nostrum had reduced the number of 50-seat aircraft in their fleets, replacing them with ATR 72s and 70-plus-seat RJs. Lufthansa CityLine completely removed 50-seat types in favour of larger CRJ900s and E190s. BA CitiExpress was renamed BAConnect, before being sold to Flybe in 2007. Its fleet of 50-seat types was then phased out in favour of Flybe's 70-seat Q400 turboprops, E175s and E195s.

The transition to larger aircraft by many of Europe's largest regional operators saw average capacities increase to more than 50 seats on a large number of routes. In some cases 50-seat types were replaced by narrowbody aircraft, including those of low cost carriers (LCCs). The European hubs that saw the most 50-seat routes increase to higher capacity segments were Vienna (VIE) with 18 routes, Munich (MUC) with 15, Luxembourg (LUX) with 14, Basel (BSL) with 12, and Barcelona (BCN) and Dusseldorf (DUS) with 10 each.

Some former 50-seat routes have seen their capacity cut since 2004. MUC and Mytilene (MJT) in Greece have both seen three former 50-seat routes suffer capacity cuts. BMI Regional now operates 30-seat ERJ-135s from MUC on services to BRN and Milan Bergamo (BGY), both of which were previously operated by other carriers using 50-seat turboprops or RJs. The MUC-BRN route was also operated by SkyWork with Dornier 328s in 2016.

A number of former 50-seat routes were cut entirely from 2004 to 2016. The hubs that saw the most such cuts were Brussels (BRU) with nine and Copenhagen (CPH), Milan Malpensa (MXP) and Paris-Orly (ORY) with eight each. Some of the route cuts can be explained by former 50-seat operators being acquired or ceasing operations. Demand remains for 50-seat aircraft in Europe, despite trends towards larger types. The 176 routes considered suitable for 50-seat types in 2016 accounted for 7.50 million seats and 175,528 flights.

The domestic Norwegian market accounted for the most seats on European routes considered suitable for 50-seat aircraft in 2016. It represented 47% of the capacity on such routes, followed by the domestic markets in France and the UK with 9% and 7%. Four of the six airports with the most 50-seat routes in 2016 were Norwegian, including BOO with 10 routes, Oslo (OSL) with nine and Tromso (TOS) and TRD with eight. Other airports with a large number of 50-seat routes were Bristol (BRS) with nine and Lyon (LYS) with eight.

Seven of the 10 largest 50-seat routes in Europe in 2016 were domestic Norwegian services *(see table, page 26)*. Many of these had an average capacity of 39 seats and were actually operated by Wideroe Q100s. The number of routes in Norway with average capacities straddling the 30-seat and 50-seat segments indicates there will be a continuing need for aircraft with 50-seats or less in this market, and turboprops in particular. This is partly due to the

TOP 10 30-SEAT AND 50-SEAT ROUTES IN ASIA PACIFIC BASED ON ANNUAL CAPACITY IN 2016

30-Seat Airport Pairs	Origin Country	Destination Country	Seats	Flights	Average seats
Kathmandu (KTM) - Pokhara (PKR)	Nepal	Nepal	400,922	11,130	36
Wellington (WLG) - Blenheim (BHE)	New Zealand	New Zealand	180,083	6,911	26
Hakodate (HKD) - Sapporo-Okadama (OKD)	Japan	Japan	137,020	4,030	34
Kathmandu (KTM) - Bhairahawa (BWA)	Nepal	Nepal	117,024	3,248	36
Kushiro (KUH) - Sapporo-Okadama (OKD)	Japan	Japan	101,796	2,994	34
Melbourne (MEL) - Burnie (BWT)	Australia	Australia	91,800	2,700	34
Sydney (SYD) - Orange (OAG)	Australia	Australia	81,816	2,405	34
Amakusa (AXJ) - Fukuoka (FUK)	Japan	Japan	81,252	2,196	37
Rarotonga Island (RAR) - Aitutaki Island (AIT)	Cook Islands	Cook Islands	79,440	2,985	27
Perth (PER) - Albany (ALH)	Australia	Australia	78,932	2,218	36

50-Seat Airport Pairs	Origin Country	Destination Country	Seats	Flights	Average seats
Wellington (WLG) - Nelson (NSN)	New Zealand	New Zealand	483,470	11,472	42
Sydney (SYD) - Dubbo (DBO)	Australia	Australia	298,319	6,477	46
Adelaide (ADL) - Port Lincoln (PLO)	Australia	Australia	298,002	7,521	40
Tsushima (TSJ) - Nagasaki (NGS)	Japan	Japan	224, 352	5,904	38
Kathmandu (KTM) - Biratnagar (BIR)	Nepal	Nepal	222,528	5,856	38
Sydney (SYD) - Armidale (ARM)	Australia	Australia	202,406	4,685	43
Fukue (FUJ) - Fukuoka (FUK)	Japan	Japan	200,448	4,452	45
Dharavandhoo Island (DRV) - Male (MLE)	Maldives	Maldives	199,980	4,213	47
Noumea-Magenta (GEA) - Lifou (LIF)	New Caledonia	New Caledonia	176,976	3,687	48
Phuket (HKT) - Ko Samui (USM)	Thailand	Thailand	174,868	3,656	48

Source: Flightglobal schedule data
Notes:
1). Figures for each airport-pair include both directions of travel. Seat and flight numbers are therefore based on two-way capacity.
2). Only includes routes with sector length of 1,000nm or less and minimum frequency of 52 annual flights in each direction.

challenging operational requirements at some remote Norwegian airports.

There were a number of new routes introduced since 2004 that had average capacities suitable for 50-seat types in 2016. BRS saw the largest number of these new routes with five, mainly due to the introduction of services from BMI Regional using ERJ-145s.

Asia Pacific

There were 142 30-seat aircraft and 161 50-seat types in service in the Asia Pacific region at the end of 2016. These represented 21% and 11% of the respective global fleets.

At the end of 1992 there were 72 30-seat types and 149 50-seat aircraft in service in Asia Pacific. All of these were turboprops.

From 1992 to 2004 the 30-seat fleet grew by 133% to 168 aircraft. This was mainly driven by the addition of further turboprops including EMB-120s, Saab 340s and Q100s. A small number of Dornier 328 Jets were also introduced by Chinese operators. During the same period the 50-seat fleet increased by 20%, due to the introduction of a modest number of CRJ200s and ERJ-145s.

From 2004 to 2016 the 30-seat fleet decreased by 15% to 142 aircraft, due to the removal of 30-seat RJ services, with turboprop numbers remaining constant. During the same period the 50-seat fleet decreased by 10% with a small reduction in active turboprop and RJ numbers.

In general, recent 30- to 50-seat fleet numbers have remained fairly consistent in Asia Pacific, with a preference for turboprops over RJs. In 2016 RJs only represented 3% of the 30-seat fleet and 20% of the 50-seat fleet. Even in the 70-plus-seat segment, which saw a 297% increase in active aircraft from 2004-2016, turboprops account for 59% of the fleet. This suggests an underlying consistent level of demand particularly suited to the operational strengths of turboprops. There are a number of operationally challenging environments in Asia Pacific, including the need to serve airports on small islands, that are inherently more suited to turboprops than RJs.

30-seat routes

The number of Asia Pacific airport-pairs with average capacities suitable for 30-seat aircraft fell from 195 to 147 from 2004 to 2016; a reduction of 25%.

A number of Asia Pacific hubs have seen capacity increases on former 30-seat routes, which are now served by larger types. Chinese airports witnessed some of the highest number of routes follow this trend. Beijing (PEK) saw seven former 30-seat routes increase to higher average capacity segments, while Zhengzhou (CGO), Hohhot (HET) and Taiyuan (TYN) all saw five routes follow this pattern. In many cases these are domestic routes that were previously served by Hainan Airlines Dornier 328 Jets, which have subsequently been replaced by narrowbodies including 737 or A320 family aircraft, operated by Hainan or other carriers. This capacity increase emphasises the level of air traffic growth witnessed in China in recent decades.

Despite this growth, Chinese airports also had some of the highest numbers of 30-seat routes cut completely from 2004 to 2016. CGO, Huanghua (HHA), and Wenzhou (WNZ) all saw three 30-seat routes discontinued during this period, due mainly to the removal of Hainan Airlines Dornier 328 services.

A small number of former 30-seat routes saw capacities cut to levels more suitable for 19-seat types from 2004 to 2016, including several domestic routes in Fiji.

There is still a need for 30-seat types in Asia Pacific. In 2016, routes with average capacities suitable for 30-seat aircraft accounted for 4.67 million seats and 141,600 flights.

The Australian domestic market accounted for the most seats on 30-seat routes in Asia Pacific 2016. It accounted for 48% of all seats on these routes, followed by the Japanese domestic market with 17% of seats. The three hubs with the most 30-seat routes in Asia Pacific in 2016 were all Australian. Sydney (SYD) had the most, with 15 destinations followed by Adelaide (ADL) and Brisbane (BNE) with seven each.

Despite a reduction in the 30-seat and 50-seat fleets, a certain level of demand is likely to remain for aircraft in these capacity segments. Key future markets could include airport-pairs in Europe or Asia Pacific with challenging operational requirements.

Australian and Japanese domestic services accounted for six of the 10 largest 30-seat routes in Asia Pacific in 2016 *(see table, page 28)*. The largest route by capacity was the service between Kathmandu (KTM) and Pokhara (PKR) in Nepal.

Some new 30-seat routes were added in Asia Pacific from 2004 to 2016. Australian hubs saw some of the highest numbers of new 30-seat routes introduced. SYD, BNE and Dubbo City (DBO) saw three new sectors each.

Significantly, Regional Express, the largest 30-seat aircraft operator in Asia Pacific added to its fleet from 2004 to 2016, by increasing its active Saab 340 fleet from 22 to 51 aircraft.

50-seat routes

The number of Asia Pacific routes with average capacities suitable for 50-seat aircraft fell from 242 to 180 from 2004 to 2016; a reduction of 26%.

Some former 50-seat routes in Asia Pacific saw the introduction of larger aircraft, which increased their average capacities beyond levels suitable for 50-seat types. PEK and Shanghai (SHA) saw the most routes follow this trend from 2004 to 2016, with eight each. In many cases these routes were previously operated by CRJ200s which have been superseded by various carriers using 737 or A320 family aircraft, again showing the growth in air travel demand in China.

A small number of Asia Pacific routes witnessed reduced seat numbers that saw average capacity fall from the 50-seat to the 30- or 19-seat segments. Perth (PER) in Western Australia saw three routes previously operated by Fokker 50s downgraded to Saab 340s or EMB-120s. In some cases this resulted in an increase in frequencies.

There were also examples of former 50-seat routes being cut entirely in Asia Pacific from 2004 to 2016. Bangkok (BKK) in Thailand and Subang (SZB) in Malaysia saw the most cuts with five 50-seat routes discontinued from each airport.

Asia Pacific routes with an average capacity suitable for 50-seat aircraft accounted for 9.60 million seats and 211,662 flights in 2016. This suggests there is still a market for 50-seat types in the region.

The domestic markets in New Zealand, Australia, the Maldives and Japan were the largest for 50-seat routes, in Asia Pacific, based on 2016 capacity. They accounted for 15%, 12%, 10% and 9% of the 50-seat route capacity in 2016. The hubs with the most 50-seat routes were Tahiti (PPT), French Polynesia, with 14, Karachi (KHI), Pakistan with 11 and Auckland (AKL), New Zealand with nine.

The largest 50-seat route by capacity was the service linking Wellington (WLG) with Nelson (NSN) in New Zealand *(see table, page 28)*. Australian and Japanese domestic services accounted for five of the 10 largest 50-seat routes. A number of new 50-seat routes were also introduced in Asia Pacific from 2004 to 2016.

The largest 50-seat aircraft operator in Asia Pacific in 2016 was Air Nelson, which operates regional services for Air New Zealand. From 20014 to 2016 the airline phased out 30-seat Saab 340s in favour of 50-seat Q300s.

More than one-quarter of the ATR 42-600s on order are destined for Asia Pacific operators, mostly for Japan Airlines (JAL) subsidiary Japan Air Commuter. The airline began operating the ATR 42-600 in April 2017.

Other regions

ATR and Embraer have also identified potential demand for aircraft with 50-seats or less in other regional markets.

In its forecast for 2016 to 2035, ATR suggests that 22% of demand for new 50-seat turboprops will come from Africa and the Middle East, and Latin America and the Caribbean.

"The use of 50-seat aircraft is steady or even growing in several emerging markets," says Silva e Souza at Embraer. "The ERJ fleet in Africa increased from 16 in 2010 to 58 in 2017, where they are in operation with 23 different companies. At the end of 2016, Embraer announced that South Africa's largest independent regional airline Airlink, is adding 11 ERJ-140s to its fleet.

"The worldwide ERJ customer base increased from 39 operators in 2010 to 70 in 2017, mostly to open up new long, thin markets," continues Silva e Souza. "In recent years, nearly half of all 50-seat RJs removed from the US market have returned to service in other regions. Two out of three have begun operating in Africa, Latin America and the Commonwealth of Independent States (CIS)."

Summary

The number of 30-seat and 50-seat aircraft in service has decreased over the past 25 years. Evidence indicates that the number of airport-pairs with average capacities suitable for these types has also been in decline.

North America remains the largest market for 30-seat and 50-seat types, but it has witnessed a pronounced shift towards 70-plus-seat RJs.

Despite falling fleet and route numbers, evidence suggests a certain level of demand will persist for 30-seat and 50-seat types. Key future markets are likely to include airport-pairs with low capacity requirements including PSO services. In Europe and Asia Pacific, airports with challenging operational requirements are well suited to smaller turboprops. Developing markets in Africa and Latin America could also have a need for 30-seat and 50-seat types. AC