The development of the short-haul jetliner fleet in 2015 is examined, and the importance of leasing companies in this market is analysed as they approach a 50% market share for the more popular aircraft types.

The development of the short-haul fleet in 2015

The worldwide active fleet of commercial jet aircraft grew by 895 units during 2015. This increase was mainly driven by deliveries of 1,490 new aircraft, but 486 were re-activated from storage, reflecting not only the buoyant state of the industry, but also how lower fuel prices have made it economic to operate some parked aircraft again. These fleet additions were offset by some 1,100 aircraft that were parked, retired or destroyed during 2015.

How does a net increase of 895 aircraft in the total passenger fleet compare to previous years? A similar review was conducted in January 2011 *(See The development of the commercial fleet during 2011, Aircraft Commerce, April/May 2012, page 4)*. In the five years since then to Dec 2015 the active commercial jet fleet increased from 15,800 to 19,000, a net increase of 3,200 units or 20.2%.

This first of two articles examines the changes in the fleets of regional jet (RJ) and narrowbody aircraft during 2015. The comparison to the 2011 benchmark is used to identify relevant trends. The most extensive analysis concerns in-production aircraft, where in many cases their owners or lessors can also be reviewed. Out-of-production aircraft and very old aircraft are also briefly examined.

In-production aircraft

In-production short-haul aircraft are divided into large RJs and narrowbodies. As of 2015, there were some 13,321 active in-production short-haul aircraft. 964 Airbus and Boeing narrowbodies accounted for two-thirds of new generation aircraft deliveries in 2015.

Large RJs

The large RJ segment, while still the smallest part of new deliveries, has seen the fastest growth in recent years. At the start of 2011 there were 950 active large RJs, but by the end of 2015 this had doubled to 1,970. Embraer E-Jets and Bombardier CRJs account for the largest portion of the fleet, with 101 new E-Jets and 42 CRJs delivered in 2015. Despite the forthcoming E2 jets, which account for the largest share of recent orders, Embraer has a current generation backlog of 245 aircraft before next generation deliveries begin. The RJ segment has more players, with Sukhoi also delivering 19 aircraft during the year.

Overall in 2015, 169 new large RJs were delivered and 45 aircraft were re-activated *(see table page 6)*. This was partly offset by 32 aircraft that were parked and seven that were retired. None were destroyed.

Embraer E-Jets

The active Embraer E-jet fleet grew by 87 units in 2015, which is similar to the net increase recorded in 2011. Given the pending arrival of the E2 jet, such a delivery stream for current generation aircraft is perhaps surprising, but the major difference to 2011 is that most new deliveries comprised the smaller E-175 variant rather than the larger E-190/-195.

In total, 84 E-175s and two E-170s were delivered. The two E-170s, which are the only E-Jet family member not to be replaced by an E2 variant, went to Japan Airlines. All of the E-175s were delivered to US regional operators. Of these, 20 were delivered to Compass Airlines to operate for American and four went to Envoy, which also operates for American. Compass now operates 62 E-170s/-175s on behalf of American and Delta. 16 went to Mesa, which now has 37 E-175s to operate on behalf of United.

A further 19 went to Republic, which now operates under Chapter 11 protection. Because Republic is now exclusively an E-170 and E-175 operator, having recently completed its disposal of DHC8-Q400s to Flybe and rejected its last remaining ERJ-145s, it is expected that Republic will not attempt to reject any aircraft related leases on E-175 equipment.

The largest group of 25 aircraft went to Skywest. All of these delivered aircraft are owned by the operators, except for a handful of Republic aircraft that are owned by Carmel Finance, a special purpose vehicle.

During 2015, nine E-190s and 10 E-195s were delivered new. Two each of the E-190s were delivered to KLM Cityhopper, Conviasa, and Colourful Guizhou. These six units are owned by their respective carriers. The remainder are owned by operating lessors.

One aircraft went to Royal Air Maroc, which is managed by Aldus Aviation and owned within its asset-backed securitisation (ABS) placement. Another aircraft was delivered to Jetairfly, the Belgian division of the TUI Group, and is leased from CIT.

The E-190 has emerged as the most favoured RJ for leasing companies. GECAS alone owns a fleet of 49 aircraft, but took no additional units during 2015.

Other lessors normally associated with mainstream narrowbody aircraft include ALC (21 aircraft), CIT (16) and BOC Aviation (13). SMBC, Macquarie Air Finance and Chinese lessors, including ICBC Leasing, Hong Kong Aviation Capital (HKAC) and CDB Leasing, also own substantial fleets on lease to various Chinese airlines. Regional-focused lessors, such as Jetscape and Aldus, both of which were recently acquired by Nordic Aviation Capital (NAC), own or manage substantial fleets. Most have been sold into ABS structures.

Of the E-195s, most (8) went to Azul, now by far the largest E-195 operator, with 66 aircraft. Three were leased by ICBC, and two went to Tianjin Airlines.

The E-195 is also popular with lessors. GECAS and ICBC own 13, HKAC 10, and CIT six. Aircastle and Orix, which are not E-190 lessors, are -

COMMERCIAL PASSENGER REGIONAL JET & NARROWBODY FLEETS FROM 01/01/2015 TO 01/01/2016

	2015			Additions			Reductions			2016			Orders
Current production aircraft	**Active**	**Parked**	**Backlog**	**Deliv.**	**Re-activated**	**Frtr conv**	**Parked**	**Retired**	**Destroyed**	**Active**	**Parked**	**Backlog**	**in 2015**
Large RJs													
E-170/-175	420	15	277	84	4		7	1		501	17	272	94
E-190/-195	628	19	182	17	11		6	2		625	37	241	89
CRJ-700	319	13	9	1	2		3	4	1	314	12	10	2
CRJ-900	310	12	57	38	10		4			354	6	44	25
CRJ-1000	39		31	4						43		25	
COMAC ARJ21			124	1						1		160	37
CS100			58									48	
CS300			180									190	
SJ100	38	17	72	19	7		5			56	20	66	51
MRJ			191									223	32
Total	**1,754**	**76**	**1,181**	**164**	**34**	**0**	**25**	**7**	**1**	**1,894**	**92**	**1,279**	**330**
Narrowbodies													
A319	1,304	31	43	23	16		24	10		1,316	32	18	
A319 NEO			48									48	2
A320	3,421	132	911	281	83		59	28	4	3,694	108	636	87
A320 NEO			2,816									3,352	684
A321	987	26	551	184	13		20	9	1	1,151	36	421	95
A321 NEO			755							0		1,101	420
COMAC C919			275							0		282	7
MC-21			175							0		181	6
737-700	1,045	29	92	7	24		28	7		1,045	29	34	
737-800	3,416	48	1,286	396	36		49	2		3,791	64	1,097	199
737-900	335	4	221	73	3		2			409	3	156	33
737-MAX			2,659									3,066	415
Total	**10,508**	**270**	**9,832**	**964**	**175**		**182**	**56**	**5**	**11,406**	**272**	**10,392**	**1,948**
In production total	**12,262**	**346**	**11,013**	**1,128**	**209**	**0**	**207**	**63**	**6**	**13,300**	**364**	**11,671**	**2,278**
Out-of-production aircraft													
BAe 146 100	5	2			1					6	1		
BAe 146 200	20	23			2			3		21	18		
BAe 146 300	20	7					3		2	16	9		
Avro RJ	97	36			10		2	5		102	24		
Fokker 70	37	8			4		2	3		39	3		
Fokker 100	138	63			13		18	7		120	64		
717	112	43			36		2			146	9		
A318	47	2			1		2			46	3		
737-300	346	131			23	9	37	31	4	317	115		
737-400	182	131			18	19	28	5	2	169	116		
737-500	195	50			13		37	13		169	61		
737-600	57	1						1		57			
757-200	452	161			7	18	80	15		373	206		
757-300	55									55			
MD-81/-82/-83	312	191			22	2		38		278	184		
MD-87	4	19						2		3	18		
MD-88	126	7			3		1	1		128	4		
MD-90	71	21					4	21		67	4		
Total	**2,276**	**896**			**153**	**48**	**216**	**145**	**8**	**2,112**	**839**		
Very old types	**80**	**124**			**11**		**14**	**30**		**72**	**102**		
Out-of-production total	**2,356**	**1,020**			**164**	**48**	**230**	**175**	**8**	**2,184**	**941**		
Fleet total	**14,618**	**1,366**	**11,013**	**1,128**	**373**	**48**	**437**	**238**	**14**	**15,484**	**1,305**	**11,671**	**2,278**

active in the E-195 space with five and two aircraft respectively.

CRJ-900/-1000

The active fleet of CRJ-900s and CRJ-1000s increased by 48 aircraft in 2015, including 10 CRJ-900s that were re-activated. This was partly offset by four that were parked. Only four CRJ-1000s were delivered and none were parked or re-activated. Compared to the same period in 2011, when only 16 -900s were produced this represents an increase, but a decrease for the -1000, when 17 were manufactured that year. The active fleet increased from 233 to 397 units over the past five years.

In common with Embraer, most of Bombardier's CRJ delivery stream went to US carriers in 2015. 21 CRJ-900s went to PSA airlines, operating on behalf of American, seven went to Mesa and two to Endeavour. The remaining eight were delivered to China Express. All these aircraft are owned by their operators.

By contrast all four CRJ-1000s delivered in 2015 are owned by operating lessors. Garuda is leasing its three from NAC, while a single delivery to HOP! is owned by TAT Leasing.

Of the 354 active CRJ-900s, some are leased or owned by third parties. Not all the leased aircraft are from unconnected lessors. Lufthansa Cityline operates a fleet of 19 aircraft that it owns, but sub-leases a further 17 to its Eurowings subsidiary. Similarly SAS sub-leases 12 aircraft to its Cimber subsidiary, which in turn wet-leases the aircraft back to SAS. The principal third-party lessors of CRJ-900s are CIT (14) and GECAS (9). Chinese lessor AVIC owns 12 of the aircraft, and Aercap 4.

Other RJs

Small numbers of other RJs were delivered in 2015. The active fleet of Sukhoi SJ100s now stands at 56 units. 19 were delivered in 2015, but a further

Despite the popularity of the E-190/-195, the E-170/-175 experienced a larger net increase in active aircraft during 2015.

seven were re-activated. This was offset by five that were parked during the year. Of these, eight went to Aeroflot and are owned and financed by Sberbank Leasing. Other aircraft financed by VEB leasing, however, have been put in storage by Aeroflot. 51 new orders were placed in 2015, of which the most significant non-Russian order is for Cityjet. One ARJ21 was delivered in 2015.

2016 will see changes to the RJ landscape, with the first deliveries of the CS100 to Swiss and the CS300 to Air Baltic. After a slow commercial start, the CSeries is generating renewed interest with a recent order from Air Canada, and confirmation of a substantial order from Delta Air Lines expected soon. The CSeries is treated as a large RJ in this review, although Bombardier and many operators consider it to be a narrowbody.

Entry into service for the MRJ looks to be slipping again, so deliveries are unlikely to begin before 2018, some four years after planned entry to service.

Narrowbody airliners

The fleet of in-production narrowbodies is a duopoly of the A320 and 737 families. Both families combined were the largest segment of the commercial fleet of 11,406 active units at the end of 2015 *(see table page 6)*. This represents a net increase of 898 aircraft during 2015.

This comes from a net rise of 601 Airbus and 449 Boeing narrowbodies. The active year-end fleets of Airbus and Boeing narrowbodies stood at 6,161 and 5,245 aircraft *(see table page 6)*.

The overall net increase reflects new deliveries of 964 new aircraft, and 175 re-activations during the period. This was offset by 182 aircraft parked in the year, 56 retired and five destroyed.

Annual growth in the active fleet is a continuation of the same trend over the past five years. At the start of 2011 there were 7,521 active narrowbodies *(See The development of the commercial fleet during 2011, Aircraft Commerce, April/May 2012, page 4)* so that there are now 3,885 more active units. This equates to an average increase of 777 aircraft per year. The higher 2015 figure reflects the continued production ramp-up by both manufacturers.

Airbus slightly increased its lead over Boeing in 2015, delivering more than 400 narrowbodies in 2011 compared to Boeing's 360.

A320 family

The A320 family has become the most numerous aircraft type in the global fleet. During 2015, 281 A320s were delivered and 83 were reactivated, while 59 were parked and 28 were retired.

An impressive 184 A321s were delivered, along with 23 of the smaller A319. The increase in A321 deliveries compared to 2011 stands out above others, as the A320 experienced a slight reduction *(See The development of the commercial fleet during 2011, Aircraft Commerce, April/May 2012, page 4)*. This appears to reflect the continuing trend towards upgauging the average aircraft size throughout the industry. Whatever the cause of this trend, be it increased demand for travel, a desire to decrease average seat costs or both, it is clearly seen in both the RJ and narrowbody segments.

A319

The active A319 fleet increased by a modest 12 aircraft in 2015, reflecting a trend towards upgauging. 24 aircraft were parked and 10 retired in 2015, but 16 were re-activated and 23 new units were delivered. Of the new aircraft, American took 7, China Eastern 6, Tibet Airlines 4 and China Airlines 3. Single units went to Avianca and Druk Air.

The relatively small number of A319s being delivered means it is no longer favoured by lessors, which like to see larger delivery streams to a broad spread of airlines to preserve residual value and maximise remarketing opportunities. No new A319s went to lessors in 2015. Three of the American aircraft and the Avianca unit were financed by enhanced equipment trust certificate (EETC) structures.

Since lessors like a spread of operators of any type, the relative concentration of A319s with a small number of operators is significant. Easyjet has 145, and American has 124. This means that 20% of the fleet (269 of 1,316 aircraft) is with two carriers. In addition, the Lufthansa (72), Delta (56) and British Airways (BA) (43) fleets account for another 171 aircraft, so one-third of the entire active fleet is operated by five airlines. It is perhaps no surprise that lessors no longer favour the A319.

Despite lessor reluctance to finance the A319, the type has historically been popular with leasing companies. The most prominent are GECAS, which owns 125 A319s, and Aercap, most of whose A319s came through its acquisition of ILFC, owns 147. Both lessors lease to a broad variety of carriers. Others include SMBC (41), CIT (23), Apollo (17), Orix (17), AWAS (14) and BOC Aviation (12). In addition, BBAM managed 44 leased aircraft on behalf of third parties. Most of these aircraft, however, were not acquired in recent years, and most lessor-owned aircraft are now 10-15 years old.

A320

The A320 is the most ubiquitous family member, with 3,694 active aircraft at the end of 2015 *(see table, page 6)*. This compares to 2,365 at the start of 2011 *(See The development of the commercial fleet during 2011, Aircraft Commerce, April/May 2012, page 4)*.

This article does not analyse the breakdown of all aircraft by region or type of carrier, but has selected a few major themes.

The largest geographical A320 market is China with a number of major operators including China Eastern (136), China Southern (118), and Shenzhen (69), Sichuan (47), Juneyao (37), Air China (35), and Tianjin (21).

Given these huge domestic fleets in China, sources of financing merit closer analysis. Leasing for Chinese carriers by Chinese and international lessors has grown in recent years. While leasing is not yet as prevalent in China as in other regions, the proportion of new deliveries to carriers owned by lessors is growing each year. In the case of China Southern, the A320s that are under five years old have a substantial proportion of lessor ownership compared to older aircraft in the fleet. The trend is similar in the case of China Eastern, with only a small portion of aircraft that are some 15 years old under lessor ownership by GECAS, Aircastle and Chinese lessors. The same pattern is broadly repeated with other Chinese operators.

The largest market for A320s has become low-cost carriers (LCCs). The largest fleet is with AirAsia, which itself is divided into several units: AirAsia Malaysia (79); Thai AirAsia (44); Indonesia AirAsia (19); Philippines AirAsia (21); AirAsia India (6); and AirAsia Japan (2). Indigo (99) is India's largest LCC and Easyjet (85), Vueling (89) and Wizz (62) are Europe's largest LCCs with A320 fleets. In the US, JetBlue (77) is the biggest A320 LCC operator.

From a financing perspective, LCCs adopt a mixed strategy between ownership and leasing. For AirAsia most of the Malaysian fleet is owned, but financed by a wide array of traditional aircraft finance lenders. Thai AirAsia has adopted a mixed approach of ownership and leasing from mainstream lessors, including Avolon, AirCastle and SMBC. Philippines AirAsia also adopts a mixed approach, with small numbers of aircraft leased from a variety of lessors, including GECAS, AirCastle and Volito. Indonesia AirAsia mostly owns its aircraft, although a few are leased from ICBC and Doric.

Indigo also has a mixed approach with many owned and leased aircraft. Major lessors to Indigo include Avolon (8), CDB Leasing (12), HKAC (13), MCAP (9) and Standard Chartered (12). Others lease one to five units.

The balance in Europe is also mixed, but airlines tend to opt for one or the other mode of financing. easyJet owns most of its aircraft, but leases small numbers from lessors including BBAM (5), Orix (3) and ALC (3).

For others most aircraft are leased. IAG-owned Vueling leases all but six of its 89 aircraft. Its lessors include Aercap (24), BOC Aviation (13), Macquarie (10) and GECAS (7). All 62 of Wizz Air's A320s are leased. GECAS is its biggest lessor with 10, but others include Goshawk (7), CDB (6), ICBC (5), Jackson Square (5), Aercap (4), AWAS (4) and BBAM (4).

In the North American market, the LCC sector is more Boeing-dominated, but JetBlue is the largest with 77 A320s. JetBlue also adopts a mixed approach between leased and owned aircraft in a two-thirds to one-third split. Of the 23 leased aircraft, 10 are leased from GECAS, six from Aercap, five from Deucalion, and two from ACG. Further south, Volaris leases all of its 35 aircraft. GECAS and Jackson Square are its largest lessors.

During 2015 the 281 new deliveries, or an impressive average of 24 aircraft per month, went to a broad variety of operators. Easyjet continued its upscaling from the A319 with 22 extra units. Other European LCCs, including Vueling (11) and Wizz Air (9), also expanded their fleets. The Chinese market absorbed large numbers, including China Eastern (13),

The majority of A320 family deliveries are now A320s and A321s. The backlog of A319 orders is diminished, and airlines are clearly showing a preference for larger variants. The A320neo had a backlog of 3,352 units at the end of 2015, compared to just 48 for the A319neo.

China Southern (6), Spring (12), Wong (7), Sichuan (10), and Tianjin (7).

Latin America also took significant numbers with Avianca (18) and Viva Aerobus (8). New aircraft in North America were rare in 2015, with only Virgin America acquiring another five units.

Of the 2015 deliveries almost 50% or 133 of the 278 aircraft were funded by lessors, with SMBC (18), CALC (17) and BOC Aviation (16) taking the biggest positions. The fleetwide proportions of owned and leased aircraft remained as above. The two largest Chinese carriers own most of their 2015 deliveries, while Shenzen and Sichuan leased a substantial portion of their fleets.

Among the LCC operators, easyJet owns all its 2015 deliveries, while Wizz Air's were leased by Goshawk (5), CDB Leasing (2), Jackson Square (1) and ALC (1). Of Vueling's 11 deliveries, all but two were financed by lessors, including ALC (3), BOC Aviation (2) and Macquarie (2).

In the Americas, LCCs took few A320s, with neither JetBlue nor Azul taking any, but VivaAerobus took eight, all of which were acquired from lessors including SMBC (3) and Avolon (3).

Outside the LCC sector, Avianca took 18 aircraft with five leased by Aircastle and six by MCAP. Qatar Airways and Lion Group's full-service carrier Batik Air took seven aircraft each, all of which were leased, except a single unit owned by Batik.

A321

The active A321 fleet over the last five years has increased faster than any other A320 family member, and now stands at 1,151 aircraft. There were 184 new additions in 2015 and 13 re-activations, while 20 were parked and nine retired.

Like the A320, the A321 features prominently with Chinese carriers, although not on the same scale. China Eastern (38), China Southern (78) and Sichuan (25) have substantial fleets, but Shenzhen and Tianjin do not operate the type. Juneyao also operates 12. Air China operates 52 A321s, but only 35 A320s.

For the Chinese carriers, the split between ownership and leasing of A321s differs to the A320s. All but two of China Eastern's aircraft are owned. A significant portion of China Southern's aircraft is leased from a variety of lessors, including Aercap (8) and smaller numbers from ICBC, CDB and HKAC.

Unlike the A320, the larger variant does not feature prominently among LCCs. Neither AirAsia nor Easyjet operates the A321. In Asia, Jetstar operates a fleet of six aircraft, all of which are leased. In Europe, only Vueling (4) and Wizz Air (2) operate small fleets of the type. All six of these aircraft are leased. The exception is JetBlue, which operates 24 units, all of which have been delivered in the past three years. As LCCs do not typically operate multiple aircraft types, JetBlue clearly needs larger-capacity aircraft in certain markets. It has also chosen to own all its A321 aircraft.

The A321 operator base is highly diversified among types of airlines and regions worldwide. The largest operator is American with 174 units, but no other US legacy carrier operates the type. American owns most of its fleet, but a significant portion is also leased. Major lessors to American include Aercap (7), ACG (5), Avolon (5), CIT (12) and GECAS (12). 43 of 174 aircraft are leased. The only other North American A321 operator is Air Canada with 17, of which 11 are leased, mainly from Aercap and CIT.

The type is also popular with many European flag carriers. Lufthansa (61) and Turkish (55) operate the biggest fleets, but Air France (19), BA (18), Iberia (17) and Alitalia (12) all have significant fleets. The medium-sized European flag carriers, including Swiss, Austrian, SAS and Finnair, all have six to eight aircraft.

Of the largest operators, Lufthansa owns all of its fleet, and Turkish owns the most of its fleet, but leases 15, including eight from BBAM. Air France leases all except four, BA owns the majority, Iberia leases all, and Alitalia leases half its fleet.

Of the 184 new A321 deliveries, 76 (41%) were leased. The main lessors in 2015 were GECAS (17), BOC Aviation (11) and ALC (8). In the US, American expanded its fleet by 30 units and JetBlue took 12.

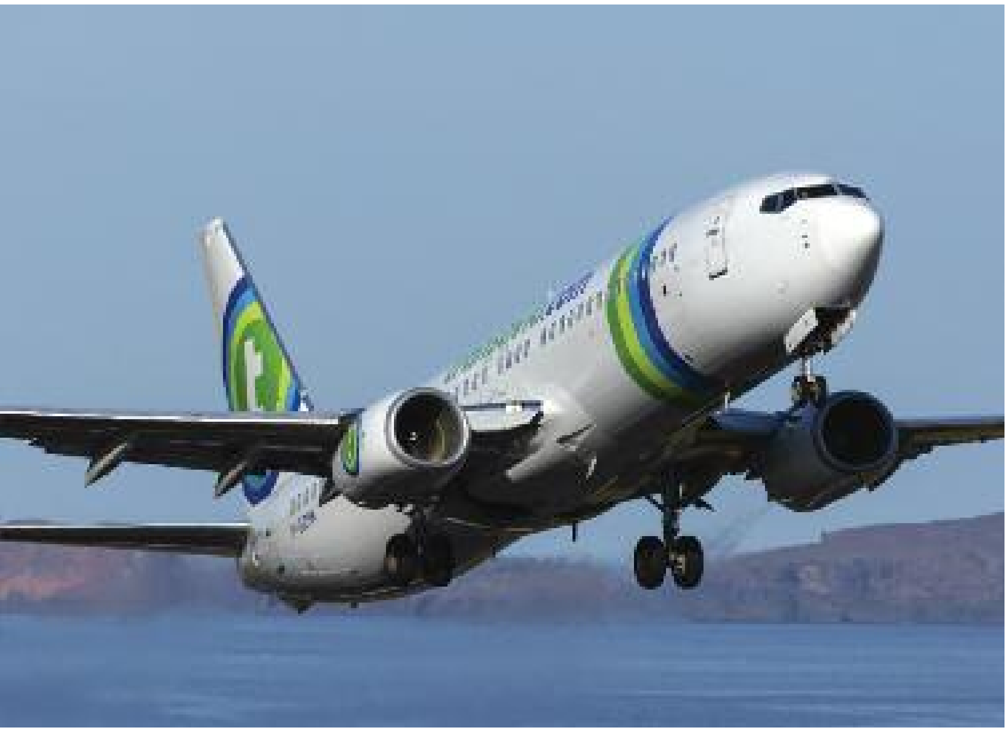
Turkish took 12 new aircraft, Air Berlin six, and Vueling and Thomas Cook five each. Apart from two of the Turkish aircraft, all the European deliveries were leased.

In Asia, Chinese carriers took more than 30 aircraft, but Asiana, EVA Air and Philippine Airlines took four to six each, most of which were leased.

In Latin America TAM and LAN took six and four aircraft respectively, of which half were leased.

737 family

The current 737NG family is the second most numerous with an active 2015 fleet of 5,245 aircraft *(see table, page 6)*. This compares to 3,243 aircraft in January 2011, so the fleet has grown by nearly 2,000 aircraft during the past five years *(See The development of the commercial fleet during 2011, Aircraft Commerce, April/May 2012, page 4)*. In 2015, 476 new 737s were added to the worldwide fleet, most of which were 737-800s (396), making it the most popular new aircraft in 2015. In addition, 63 stored aircraft were re-activated, but this was offset by 79 parked and nine retired aircraft. The upgauging trend is also noticeable among Boeing narrowbodies in that few -700 variants continue to be delivered and the -600 variant is now out of production. The -900, which is the newest version, is also being produced in significant numbers, but not as much as the A321.



While the 737 MAX has generated a firm order backlog of 3,066 units, the 737-800 continues to sell well and has an order backlog of 1,097 aircraft. More than 400 737NGs were delivered during 2015.

737-700

The smallest in-production family member is concentrated with a single LCC operator. Of the active fleet of 1,045 aircraft, 461 are in service with Southwest Airlines. This is now an ageing fleet with some 60% aged from 10 to18 years. The newest aircraft are now four years old. Most of the fleet is owned, but 63 are leased from a variety of lessors including: GECAS (22), BOC Aviation (14), Aercap (9), ACG (7) and Aircastle (3).

The next largest market is China, with a total fleet of 170 aircraft, divided among several carriers. China Eastern (44) and China Southern (30) are the largest. There are a number of smaller operators, including Xiamen (15) and Lucky Air (10). The majority are owned, but about one-quarter are leased, with Aercap (19) as the largest lessor.

Latin America is also a popular 737-700 market, with GOL operating 36. COPA, Aerolineas Argentinas, and Aero Mexico all have significant fleets, the majority of which are leased.

In Europe, SAS operates 28 aircraft, and KLM 18. Both carriers lease most of those aircraft. Others, such as Germania, Meridiana, and Jettime, operate smaller fleets.

The few 737-700 deliveries in 2015 all went to Chinese carriers, including: China Eastern (3), Shanghai Airlines (3) and a single unit for Ruili. All are owned by respective operators.

737-800

By the end of 2015 there were 3,791 737-800s *(see table page 6)* in service, more than any other 737 member. The fleet also has very diverse characteristics in terms of operator base, geographical distribution and type of customer carrier.

Ryanair, with 319 aircraft, is the world's largest 737-800 operator, and along with Southwest, is one of the world's biggest LCC operators. In common with some of the biggest LCCs, Ryanair owns most of its aircraft.

Since much of the LCC business model is based around simplicity, such a vast exposure to aircraft future value risk seems counter-intuitive. Nevertheless, Ryanair leases 41 of its total fleet. The main lessor is SMBC (17), but others include KV Aviation (10), Avolon (8) and two each from BBAM and Orix. The Ryanair fleet is relatively young, with 265 of 319 aircraft less than 10 years old, and with no aircraft more than 13 years.

Europe's other large 737-800 LCC operator is Norwegian with a fleet of 91 aircraft. With a few exceptions, most of its fleet is less than five years of age. Norwegian leases some of its aircraft from unconnected third-party lessors, and others from affiliated captive entities. Norwegian has a diversified lessor base, with no single lessor owning more than seven aircraft. Jackson Square (7) is the largest, with Aercap (5) and AWAS, each leasing five of the aircraft to Norwegian.

In the US LCC market, Southwest also leads with 103 aircraft. In a similar strategy to Ryanair, all but a handful of these are owned, with a few pairs leased from lessors, including ACG and Aercap.

Legacy carriers, particularly in the US, also dominate the 737-800 fleet list. American (263), United (128), Delta (72) and Alaska (61) operate large fleets. For US carriers, most of the aircraft are owned, but both GECAS and Aercap stand out as major lessors with 89 and 82 units. Aercap leases mainly to American, and the GECAS fleet is divided between American and United. Others including SMBC (18), ALC (10), and Orix (7) are present on a smaller scale.

Like the A320, the Chinese market is the largest, with 873 aircraft dwarfing the 654 in the US market. The Chinese fleet is also younger. The fleet is widely distributed around the major operators including: China Southern (128), China Eastern (113), Hainan (110), Xiamen (102) and Shandong (85).

Both international and local lessors are financing the relatively young Chinese fleet, including global lessors Aercap (63), GECAS (56), ALC (32), SMBC (20), and BBAM (20), and Chinese lessors, including ICBC (55) and BoCom (24).

A further rapidly growing market is Indonesia, where Garuda operates a substantial fleet of 78 aircraft. The Lion Group currently has 55 units, along with its substantial 737-900 fleet. Both Garuda and the Lion Group lease the majority of their aircraft from a spread of lessors.

Of the 396 2015 new deliveries, a similar 50% proportion compared to the A320, were funded by lessors with Aercap (25), ICBC (25) and ALC (22) taking lead positions. GECAS (17), SMBC (15) and Avolon (13) also took important positions.

Among Chinese airlines, China Eastern took 23 aircraft, most of which are owned, whereas China Southern (13) leased most of its aircraft. Hainan (20) and Shandong (11) took deliveries on a mix of leases and ownership.

Among LCC operators, Lion Group (25) took the most deliveries, although this includes eight for the full-service Batik Air subsidiary. These were leased from a variety of lessors, including GECAS, Avolon and SMBC.

Ryanair (23) and Southwest (21) continued their strategy of aircraft ownership, while Norwegian (9) adopted a mixed approach. Westjet (12) in Canada expanded its fleet and owns all its 2015 deliveries, while GOL (6) in Brazil leased all its extra capacity from GECAS.

Among legacy operators, American (16) owns all its 2015 deliveries, except two that were leased. Aeroflot (9) leases aircraft from VTB and Aeromexico (7) leased all its aircraft from Avolon, Jackson Square and SMBC. COPA (9) leased six of the aircraft from SMBC and BBAM and owns the balance.

737-900

The 737-900, although the largest family member, is the least ubiquitous, with 409 aircraft in active service. Out of this fleet, 52 constitute the standard -900, and the remaining 357 are the -900ER.

In 2015, 73 new -900ERs were delivered, a further three were activated, and two were parked *(see table page 6)*. The fleet has increased from an active 134 aircraft in January 2011 *(see Issue 81, page 8)*. To a degree, the aircraft meets the need for extra capacity in the 737 family and is also a 757 replacement option in some cases, but its operator base is dominated by US carriers.

There are only eight aircraft in China: Shenzhen (5) and Okay Airways (3).

Of 409 aircraft, 236 in the US market are with three main carriers. United has one-third of the entire active fleet (140), while Delta (49), and Alaska (47) have the remainder. Apart from four aircraft from GECAS, the entire United fleet is owned. Most of the Delta fleet is also owned, but 19 are leased from CIT. The Alaska fleet is all owned. The relative lack of lessors in the US market may reflect the type's small operator base globally.

Outside the US market, the Lion Group (90) is by far the largest operator. Most are with Lion Air Indonesia, but 13 operate in the Thai Lion subsidiary, and six are with Malindo in Malaysia. While the Lion Group prefers to lease aircraft, about 50% of its 737-900 fleet is owned directly, and six are owned by its captive Lessor Transportation Partners. The remainder are leased from several lessors including: GECAS (8), Aircastle (7), and six each from BOC Aviation and Deucalion. Jackson Square and Amentum also lease four each to Lion.

The remaining largest operators include Korean (21) and Turkish (15). All of these aircraft are owned.

Of the 73 new deliveries, most went to the core of US-based operators: Alaska (11), Delta (19) and United (21). Of these, all are owned by their operators, except for nine leased to Delta by CIT. Lion Group and Turkish took five each and Oman Air four. Lion Group leased three from BOC Aviation and two from Goshawk. Turkish and Oman Air own their aircraft.

Out-of-production aircraft

This group of older types no longer in production includes RJs from BAe and Fokker. For narrowbodies the types include the A318, 737 Classics, the 757, the 717 and MD-80 series aircraft.

During 2015 the active fleet of out-of-production aircraft declined by 172 to 2,184 aircraft. This includes 175 aircraft that were retired during the period. A significant number were also reactivated during the period, including 36 previously parked 717s.

The 757 remains a popular out-of-production aircraft, but its fleet declined substantially during 2015 with 80 units parked, 15 retired and seven re-activated, so that only 373 757-200s remain active. There is an additional 757-300 fleet, mainly with US operators American and United, but significant smaller fleets operate with Condor and Icelandair.

Lessors are less prevalent than before, but GECAS (10) and Guggenheim Partners (13) are significant players.

The once ubiquitous 737 Classic fleet also declined to 655 units from 723 in 2015. Southwest still operates over 120 737 Classics, but other operators include UT Air (37), Sriwijaya Air (23), ANA (18), and Jet2 (17). Significant lessors of Classics include: GECAS (36), Aercap (31), ACG (13), and AWAS (13).

In addition 57 737-600NGs remain in service, including 25 with SAS and 13 with Westjet. All but three of the SAS aircraft are leased and the Westjet aircraft are owned. AC