TrueNoord



TrueNoord Insight

70-Seat Regional Jet Market Report

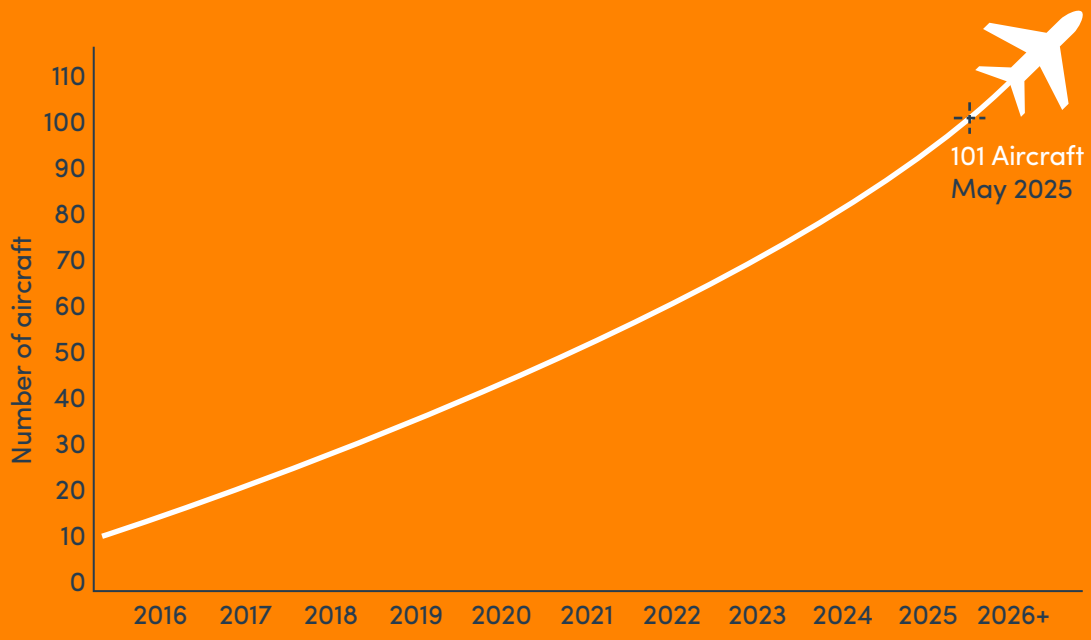
May 2025 | Angus von Schoenberg

Connecting people, communities and businesses across mature and developing economies worldwide



TrueNoord is a dynamic regional aircraft leasing company with offices in Amsterdam, Dublin, London, and Singapore. It is a full-service platform providing leasing and lease management services, supported by extensive knowledge of aircraft finance, to operators and investors worldwide in the regional sector.

Our trajectory



Contents

1	**Introduction and Scope**	**9**
2	**Summary Specifications, Performance & Economics**	**10**
2.1	Capacity and Configuration	10
2.2	Principal Specifications & Weights	17
2.3	Engines	17
2.4	Range	18
2.5	Performance	18
2.6	Economic Comparison	19
2.7	Discussion of Economic Comparison Points	22
2.8	Emissions	22
3	**Market Review**	**24**
3.1	Deployment of Regional Jets	24
3.2	Numbers in Service Update	27
3.3	Delivery Profile	28
3.4	Firm Order Backlog	29
3.5	Number of Regional Jet Operators	29
3.6	Geographical Dispersion	30
3.7	Concentration	31
3.8	Operator Quality	32
4	**Regional Jets Owned by Lessors**	**34**
4.1	Proportion of Leased Regional Jets	34
4.2	Regional Jet Lessors – Who's Who	35
4.3	Regional Jet Leased Fleet Analysis	35
5	**Market Availability and Demand**	**38**
5.1	Demand and Supply Drivers	38
5.2	E-jet Availability - Aircraft in Storage	39
5.3	Placements of Used Aircraft from 2015 to Date	40
5.4	Risk Factors	40
6	**TrueNoord CMV and FMV Assessment**	**42**
6.1	General Trends	42
6.2	New Value Trends	43
6.3	Used Regional Jet Value & Lease Trends	44

The information and any analyses contained in this document are taken from, or based upon, non-confidential information obtained by TrueNoord or from publicly available sources, the completeness and accuracy of which has not been independently verified, and cannot be assured by TrueNoord. This document is not intended to, and should not be construed as, representing the policies, positions or views of TrueNoord. The statements contained herein are based solely upon the opinions of the authors and the data and information available to the authors at the time of publication.

2025 TrueNoord

Executive Summary

Scope

- Although there are both dedicated 50 seat and below regional jets and larger 100+ seat RJs, this report covers those with a capacity above the 50-seat threshold and up to a maximum of 88 seats.
- Types covered include: CRJ700; CRJ900; E170 and E175. Although some of these can carry up to 88 passengers, the majority are configured with less than 80 seats and are often referred to as 70-seat category aircraft.
- There are also some comparative references to the E190. New Generation, E190/195-E2 and A220 and large Regional Jets (E190/195-E1) are excluded and are the subject of a previous report "TrueNoord Insight: Small Narrowbody & Large Regional Jet Market Report " (July 2024).

Key Facts

- The total fleet of all regional jets comprises over 2,500 aircraft of which the 70-seat category is the largest portion with 1,700 units. This compares with over 17,000 A320 and 737 family narrowbodies and some 4,500 A330, A350, 777 and 787 widebodies.
- The majority (81%) of all 70-seat Regional Jets are operated in North America and 58% of all classes of regional jet.
- Except for 15 aircraft in corporate applications, all 70-seat Regional Jets in North America fly for major airlines under long-term capacity agreements. As capacity providers on fixed cost contracts, the regional operators are not responsible for sales and distribution of seats. Consequently, they assume no passenger demand related risk.
- North American regional airlines with regional jets are precluded from operating aircraft with more than 76 seats by "Scope Clause Agreements" with mainline carriers.
- Larger 100+ seat regional jets are more common outside North America.
- All subject regional jets, except the E175-E1, are now out of production.
- While the longest range of a regional jet is over 2,000nm or in excess of four hours, the vast majority of regional jets perform short sectors of 1-2 hours.
- All the subject regional jets are powered by General Electric CF34 engines. The CRJ700/900 and E170/175 are equipped with CF34-8s.
- Regional jets offer lower trip costs than larger narrowbodies, but higher per seat costs.
- Regional jets have higher operating costs per trip compared to turboprops, but that difference erodes on sectors over two hours as turboprops are slower.
- The largest number of regional jets were manufactured between 2005 and 2009 with an average of 140 units each year. A second production peak (mainly E175) with an average of 125 per year occurred between 2014 and 2016, thus a large portion of the fleet has an average age of around 20 years or 9 years.
- The youngest regional jet fleet is the E175-E1 with peak production levels reached in 2016. Current production rates are around 30 per year.
- 9.5% of all E170/175s and 14.5% of all CRJ700/900s are owned by lessors. This is a much lower lessor penetration rate compared to any other aircraft class including larger regional jets and turboprops.
- There are five lessors with over ten 70-seat Regional Jets that exclusively serve the regional aircraft segment, and three mainstream large lessors are exposed to regional jets. In total 18 lessors own 70-seat Regional Jets.
- Many regional carriers began recovering ahead of their mainline counterparts as their lower capacity aircraft were ideal to supply the pandemic-induced lower levels of demand.
- While the number of stored aircraft should not be viewed as a proxy for available supply, the proportion of 70-seat Regional Jets stored remains at around 9.5%. The proportion stored for A320 and 737 family narrowbodies is very similar and that of A330, A350, 787 and 777 widebodies is marginally lower.
- The secondary market for used 70-seat Regional Jets is limited since most are operated by North American carriers for most of their economic lives.

70-Seat Regional Jet SWOT & Key Takeaways

Small Narrowbodies

Strengths

- 70-seat Regional Jets address a sizeable market for capacity of between 65-88 seats mainly in North America
- Some of the regional jets can operate from restricted airports with short runways or obstacle clearance impediments
- Provide mainline carriers with ideal complementary capacity to feed hubs
- Enable major airlines to right size capacity during weaker demand periods
- Can be used to maintain or develop frequency and consequently improve yield
- Tend to operate in higher yield markets with monopolistic characteristics
- Most 70-seat Regional Jets provide capacity to major airlines under long-term contracts
- 70-seat Regional Jets are protected by U.S. scope clauses

Weaknesses

- Regional jets have higher operating costs per seat than narrowbodies and turboprops
- Relatively high fuel-burn per seat leads to above average emissions
- Only the E175-E1 remains in production
- With the demise of the Mitsubishi MRJ no new regional jet is on the horizon, apart from the E175-E2 in a timeframe to be confirmed
- Excess concentration in North America for smaller 70+ seat category
- There is never likely to be an aftermarket for converted 70-seat Regional Jets in cargo applications
- High cost of mid-life maintenance particularly for engines

Opportunities

- Can be ideal new route development tool at lower risk
- Any growth of low passenger volume point-to-point routes
- Unexploited routes in developing world with poor alternative transport infrastructure
- Ageing fleet provides opportunity to diversify operator base at relatively low cost
- Conversion of 70-seat Regional Jets into sub-scope clause compliant aircraft (CRJ550/E170)
- Could capture a greater portion of longer distance government subsidised routes

Threats

- Sustained higher fuel prices could reduce attractiveness of regional jets
- Despite gradual easing of both pilot and cabin crew shortages, this continues to slow growth
- Ageing fleet will lead to greater obsolescence risk although much of this fleet remains relatively young and is mitigated by ongoing E175 production
- Any future relaxation of North American scope clauses could see 70-seat Regional Jets decline in a similar way to 50 seaters
- Alternative propulsion systems could impact economic life of regional jets more than other aircraft classes
- Airport restrictions or penalties for the operation of 70-seat Regional Jets

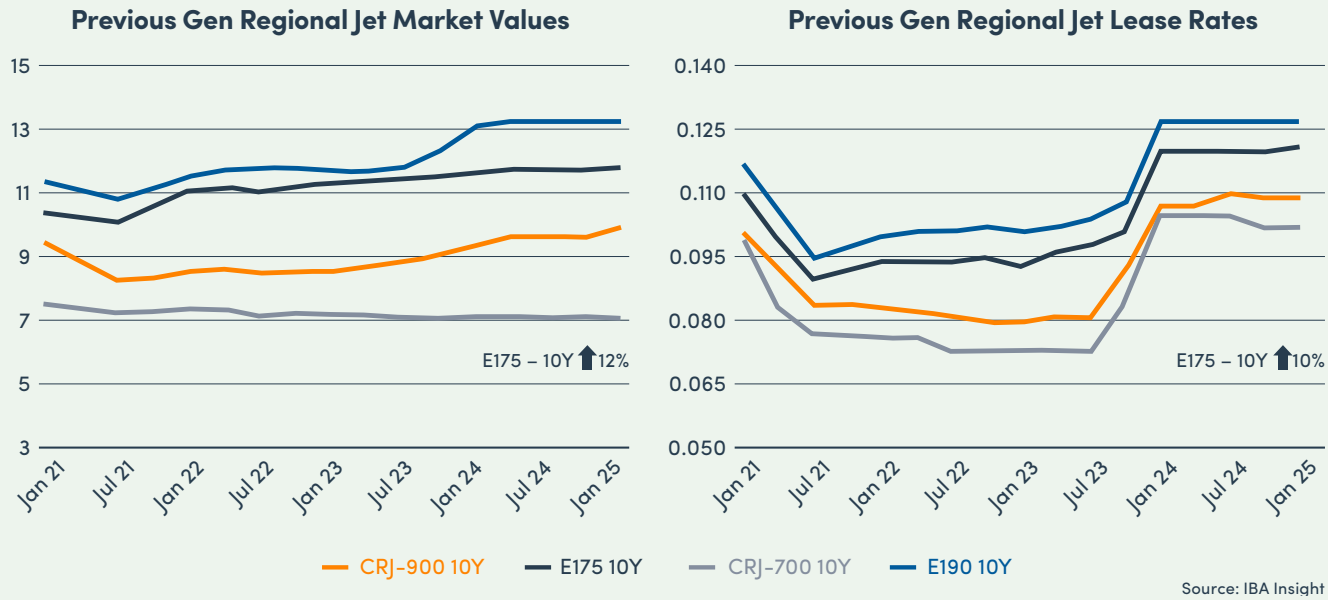
Values & Lease Rates

- According to appraisers, current market values (CMV) and lease rates of 70-seat Regional Jets have recovered significantly over the last two years post the pandemic, although the out-of-production CRJ700/900 recovery has been anaemic.
- Market lease rates have strengthened for all 70-seat Regional Jets. CRJ700/900 lease rates have increased by 7-9% since 2022. For their Embraer counterparts E170 rates have remained stable while E175 rates have risen by 12.5%.
- Appraisers partially rely on transaction datapoints to determine current market and future values, but very few regional jet sales have occurred at any value. This means that in many cases insufficient empirical evidence exists to support the current market values suggested by the appraisal community.
- Some regional jet values have recovered faster than others. All vintages of the E175 recovered faster than others followed by the E170. With few exceptions CRJ700/900 values remain depressed but stable.
- CRJ700/900 and E175 values almost entirely driven by their remaining economic utility in North America. By contrast, as there is a broader global distribution of E170s there are more data points from which to establish CMVs.

IBA Market Values and Lease Rate Snapshot

According to the IBA, both market values and lease rates of regional jets have recovered substantially since their COVID-19 related values in early 2021. The examples show value and lease rate progression of constant age 10-year-old aircraft.

Limited supply and increase in lease extensions provide stable market for older regional aircraft



Source: IBA Insight

CMV Average in US$ million Dec 2024

Aircraft	New	Used 10 yrs
CRJ700	N/A	9.29*
CRJ900	N/A	10.17*
E170	N/A	8.77
E175	29.4	11.76**

*CRJ700/900 values protected by U.S. fleet where 87% of all CRJ700s are operated an 73% of all CRJ900s.
**E175 fleet values protected by North American fleet where 90% of fleet is operated.

Source: TrueNoord Analysis of Average CMVs from Avitas, IBA Insight, mba & Cirium

Market Lease Rate Average in US$'000'

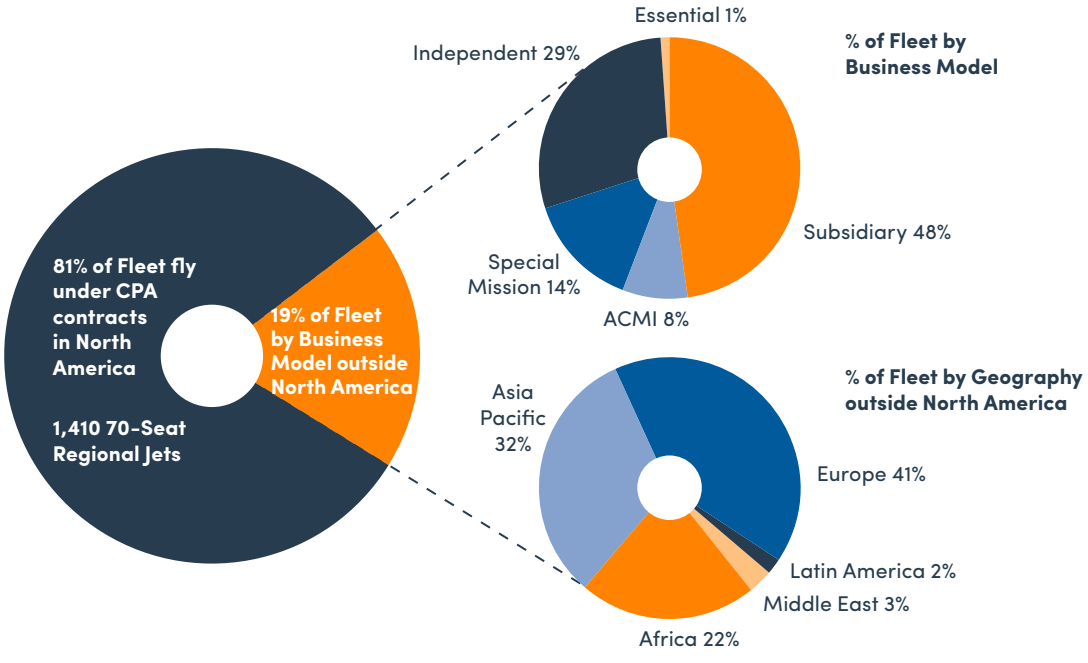
Aircraft	New	Used 10 yrs
CRJ700	N/A	88
CRJ900	N/A	108
E170	N/A	88
E175	188	116

Source: TrueNoord Analysis of Average MLRs from Avitas, IBA Insight, mba & Cirium

Key Data

- 90% of all 70-seat Regional Jets provide capacity to major airlines either under capacity purchase agreements or as wholly owned subsidiaries.
- 81% of all 70-seat Regional Jets operate in North America.

Key Fleet Data



Source: Cirium & IBA Insight



TrueNoord Fleet
5 Embraer E175

AIR CANADA

1 Introduction & Scope

Today's 70-seat Regional Jets comprise a combination of Embraer E-Jets and the formerly Bombardier owned CRJ series. The Embraer E-Jet is a family of medium range jets, carrying from 66 to 146 passengers, while the now out-of-production Mitsubishi Heavy Industries owned CRJ family ranges from 50 to 104 passengers. The larger E190/195 and the CRJ1000 are outside the scope of this report.

Following the earlier CRJ100/200, the current generation of CRJs was initially launched as the CRJ700 in 1997 and while it was a stretched derivative of the previous 50 seat aircraft, it also incorporated a slightly wider fuselage, a lower floor and a new larger wing. In 2007, it was superseded by a stretched Next Gen variant, the CRJ900 with improved fuel burn and a further lowering of the floor. This is now the dominant CRJ variant. In addition, 2010 saw the introduction of the CRJ1000 with up to 104 seats.

The E-Jet family came later than the CRJ700 and was first launched in the late 1990s with entry to service as the 70 seat E170 in 2004. The 76-88 seat E175 and larger 100-114 seat E190 followed quickly thereafter, with both entering service in 2005.

Both the CRJ and E-Jet aircraft are principally used by mainline and regional airlines around the world, but a restricted number of executive E-Jet aircraft based on the larger E190 platform have been manufactured as "Lineage" versions for VIP applications. In the case of the CRJ, the application as executive jets arose in the opposite direction as the CRJ100/200 was born as a derivative of the Challenger business jet.

After the relative success of both Bombardier and Embraer in the 37-50 seat segment, both OEMs had observed that Boeing and Airbus were gradually leaving the 100-150 seat segment and believed there remained a strong market below 120 and up to 150 seats. Both adopted a different larger aircraft strategy to supply that market. Bombardier preferred to upgrade and stretch its existing platform, while Embraer had to adopt a clean sheet approach as the smaller E145 generation aircraft only offered three abreast seating, while Bombardier already had 4 across. However, the Embraer approach proved more successful in the long run as it now provides the dominant platform in the regional jet space.

Scope

Whilst the regional jets category includes those from the 37 seat ERJ-135 up to the E195-E1 and, according to some, might also comprise the latest generation E195-E2s or even the A220-300, this report provides an overview of the 70-Seat Regional Jet market primarily covering the E170/175-E1 and the CRJ900. The smaller CRJ700 is also covered, although less extensively and some references to the larger E190-E1 are also included.

The report will examine aircraft characteristics, applications, market penetration, and operating economics as well as addressing the current dynamics in values of these aircraft, which sees a growing variety of opinions from the appraisal community.

In addition, the report includes a comparative section on emissions for the applicable aircraft.

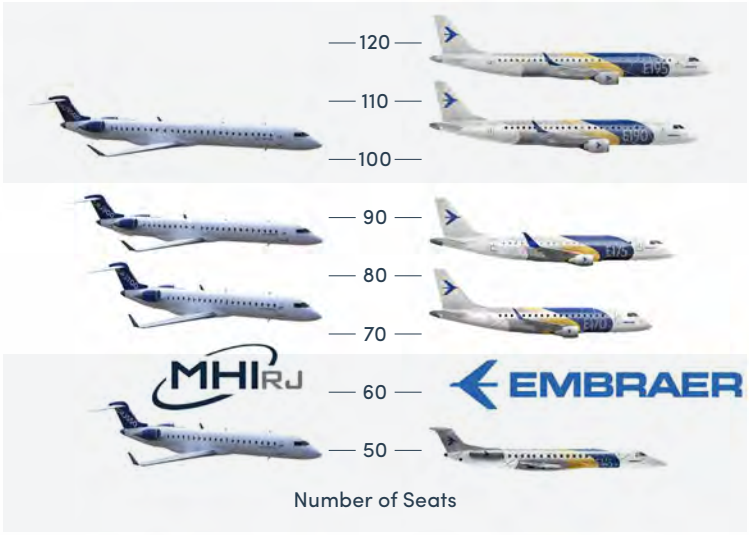
2 Summary Specifications, Performance, and Economics

2.1 Capacity and Configuration

2.1.1 Capacity & Cross Section

The relative seating capacities of the E-Jet and CRJ families are shown in Figure 2.1. The subject E170/175 and CRJ700/900 are highlighted in the middle with the smaller and larger regional jets shown above and the smaller CRJ200 below. The ERJ-145 is not part of the E-Jet family and is therefore not shown. At the lower end of the spectrum, the CRJ550 is a 50-seat version of the CRJ700, which contains a generous 10 seat business class, 20 extra legroom economy seats along with 20 standard economy seats. It also meets a 50-seat limit imposed by some US regional carriers for scope clause regulations that require a certain proportion of their fleets to have no more than 50 seats. There is no 50-seat equivalent in the E-Jet family.

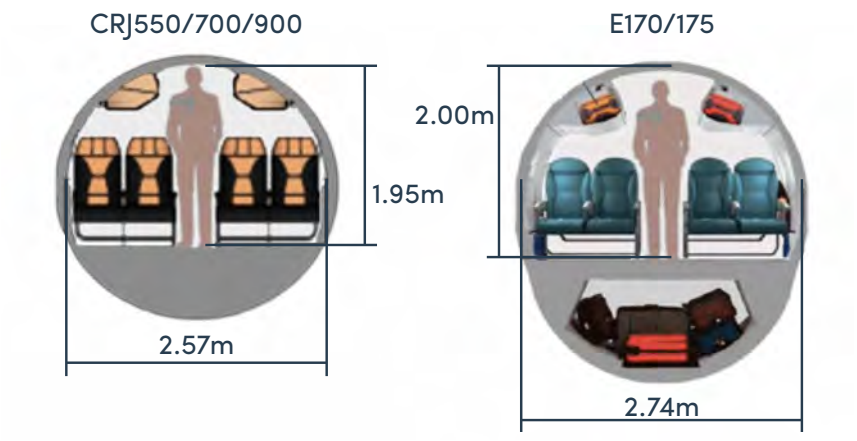
Figure 2.1: E-Jet & CRJ Seating Capacity



Source: TrueNoord Intelligence

The E-Jet fuselage is 17cm wider than the CRJ, so it can accommodate a slightly wider aisle and seats. With this greater width along with a "double bubble' construction (as shown in Figure 2), both the main passenger deck and the under-floor space is greater in the E-Jet. To compensate for the restricted underfloor space in the CRJ, there is a rear baggage bay located behind the aft bulkhead. The larger cabin cross-section of the E-Jet also enables larger overhead stowage bins for carry-on baggage.

Figure 2.2: E-Jet & CRJ Cross Section



Source: Leeham Company LLC

The CRJ900 and the E175 are the closest competitors in terms of capacity, and both offer a similar payload. Across the range, the E175 and the CRJ900 are now also the most popular variants from both manufacturers.

However, the E175 has become the aircraft of choice for US regionals because:

- As referenced above, the aircraft offers a wider cabin. This improves the first-class experience for the North American fleet and enables better seating and aisle width in all classes.
- The E175 has larger overhead stowage bins for carry-on bags. The latest recently launched upgrade of the E175 introduces larger overhead bins that enable wheels first storage for roller bags.
- The E1+ variant with winglets offers a 5% fuel burn benefit over the previous E175.
- The cargo hold capacity of E175 is also slightly greater than that of the CRJ900. The CRJ900 offers a cargo compartment volumetric load of 16.8m^3 compared to 17.3m^3 in the E175.

Given that US regionals order aircraft in bulk, this has had the effect of making the E175 the most popular variant of the E1 family. It is also the only E1 variant that is still manufactured so that its total fleet size will continue to grow relative to other E1 variants.

Figure 2.3: The Relevance of Scope Clauses

Scope clauses are provisions in labour contracts between major U.S. airlines and their pilot unions that define the extent to which airlines can outsource flying to regional airlines or affiliates. Often referred to as capacity providers since the sale and distribution of seats rests with the mainline carriers, supply contracts are typically called 'Capacity Purchase Agreement(s)' (CPA). With the aim of limiting the extent to which major airlines can shift flights to lower cost suppliers, these clauses protect the pay and working conditions of mainline pilots while allowing US network airlines some flexibility to operate regional aircraft through subsidiary or partner CPA providers.

The principal limitations imposed by scope clauses apply in two different ways:

- **Aircraft Size and Seat Limits**

  Size is defined by both the weight of the aircraft and the number of seats. Scope generally imposes a maximum take-off weight (MTOW) to 86,000lbs (39 tonnes) and a ceiling on the number of seats to no more than 76. These are firm limits for all US majors although a slight relaxation was announced by American in August 2022 enabling it to add a row of 4 additional seats to its CRJ900 fleet operated by its subsidiary PSA. However, there is no indication that this was ever implemented. It is the MTOW limit that is preventing a newer generation of regional jet versions like the E175-E2 from entering U.S. operation.

- **Number of Aircraft**

  In many cases scope clauses restrict the number of regional aircraft that are permitted to fly for major carriers to a proportion of the total mainline fleet or an airline might only be allowed to outsource a certain percentage of its total flights to regional carriers, ensuring a balance between mainline and regional operations. Unlike size or weight, no hard limits apply. Instead, these vary between carriers. For example, at American the number of regional aircraft above 65 seats cannot exceed 40% of the mainline narrowbody fleet. At United there are two limits: a maximum of 255 aircraft between 51-76 seats of which 76 seaters are further limited to 153 aircraft. Delta is limited to 223 76 seaters and 102 70 seaters. To enable Delta to increase the size of its regional fleet beyond these limits, the carrier has adapted some of its partners' CRJ700s to CRJ550s with 50 seats, as there are no limits to this capacity category.

There may also be additional restrictions that include restricting the number of international flights that can be operated by regional partners or a prohibition on flying some routes that are also served by mainline aircraft. In practice the range of regional jets means international flights are limited to Mexico and Canada. Nevertheless, a Delta Connection flight by SkyWest to, for example, Mexico would be a route approved within Delta's scope clause agreement.

For the above reasons, the U.S. regional aircraft market is restricted to the operation of 70-seat category aircraft and therefore airlines cannot deploy larger regional jets with their regional partners. Similar regulations also apply in Canada. The concept of scope clauses is not unique to North America as they also apply in Europe, but the limitations differ. In Europe, the salary differential to mainline flight crews is less pronounced and this enables more flexible scope clauses. Such clauses vary by European carrier but generally set a seat limit at around 100 seats, which enables carriers like Lufthansa CityLine to operate CRJ900s with 90 seats and facilitates larger E190-E1s. More recently, KLM Cityhopper has been enabled to operate 132 seat E195-E2s.

2.1.2 Configuration

As these aircraft are primarily deployed in North America, where both market demand drives a need for first class seating and premium economy with greater seat pitch and where scope clause regulations (see Figure 2.3) prohibit more than 76 seats in any regional jet and less in some cases, all are dual class. Figures 2.4 and 2.5 show the seating configurations in service for U.S. majors for E170/175 and CRJ700/900 respectively.

2.1.2.1 E170/E175

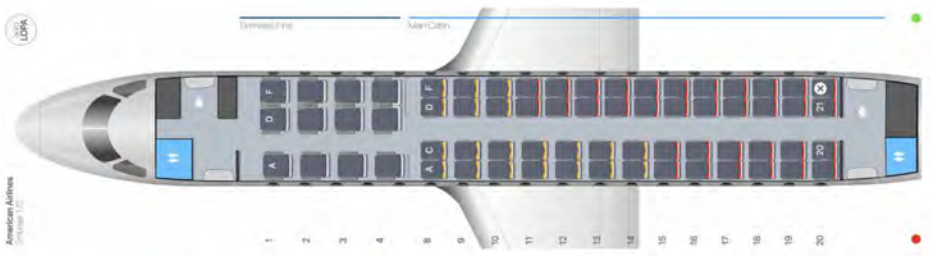
The table in Figure 2.4 shows the number of seats in each of first ("C" Class), premium economy ("W" Class) and economy ("Y" Class) on each of the aircraft operated on behalf of U.S. mainline carriers. The example visual layouts (LOPAs) depict some of those in the table below and also include a single class LOPA that is typical outside North America.

Figure 2.4: E170/175 Seating Configuration

CPA Provider	Model	Operated For	No. Aircraft	First	First Pitch"	Prem Econ	Prem Pitch"	Econ	Econ Pitch"	Total Seats
Republic	E170	American Eagle	2	12	36	20	34	34	31	66
Republic	E170	Delta Connection	11	9	37	20	34	40	31	69
Republic	E170	United Express	18	6	36	16	34	48	31	70
Republic	E175	American Eagle	78	12	36	20	34	44	30	76
Republic	E175	Delta Connection	46	12	37	20	34	44	31	76
Republic	E175	United Express	49	12	37	16	34	48	31	76
SkyWest	E175	Alaska	42	12	38	12	34	52	31	76
SkyWest	E175	American Eagle	20	12	36	20	34	44	31	76
SkyWest	E175	Delta Connection	86	12	37	20	34	44	31	76
SkyWest	E175	United Express	110	12	37	16	34	48	31	76
Mesa	E175	United Express	60	12	37	16	34	42-48	31	70-76
Horizon	E175	Alaska	44	12	38	12	34	52	31	76
Envoy	E170	American Eagle	43	6-12	37	20	34	33-39	31	65-70
Envoy	E175	American eagle	126	12	37	20	34	44	30	76

Source: Cirium, AeroLOPA, SeatGuru

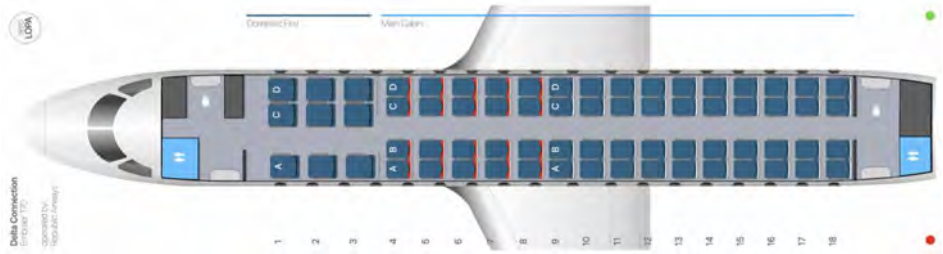
E170 American Eagle by Republic (66 seats: 12C@36", 20W@34", 34Y@31")



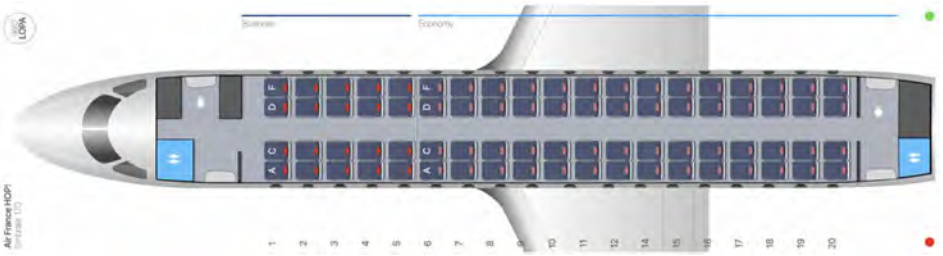
E170 United Express by Republic (70 seats: 6F@36", 16W@34", 48Y@ 31")



E170 Delta Connection by Republic (69 seats: 9C@37”, 20W@34”, 40Y@31”)



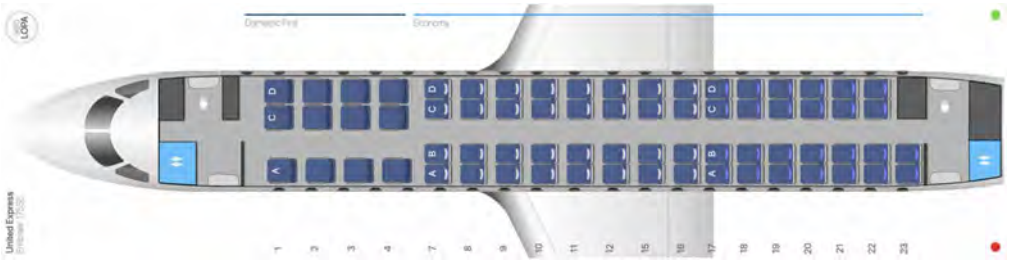
E170 Air France HOP! (76 seats: 20C@36”, 56Y@31”)



E175 American Eagle by Republic & SkyWest (76 seats: 12C@36”, 20W@34”, 44Y@30”)



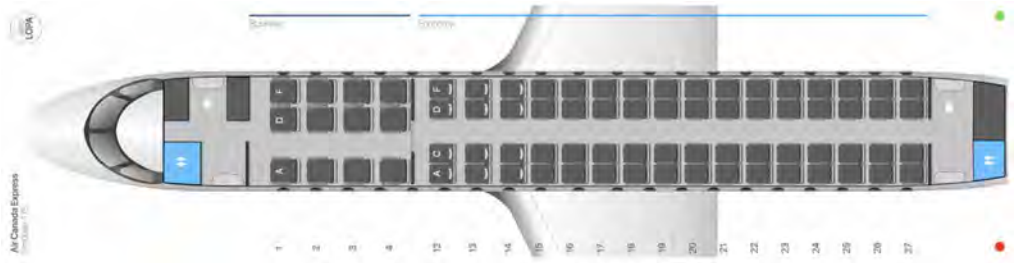
E175 United Express by Republic and SkyWest (70-76 seats: 12C@37”, 16W@34”, 42-48Y@31”)



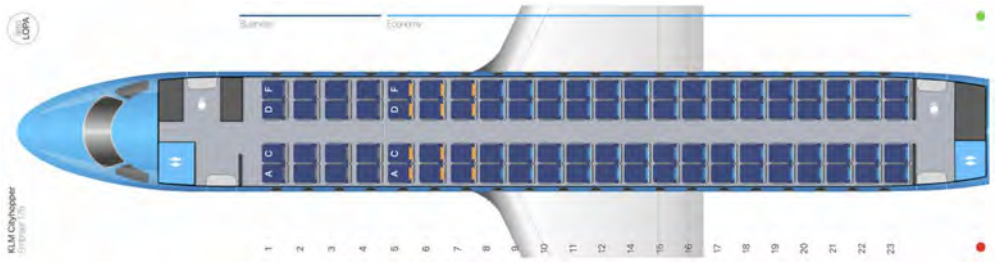
E175 Delta Connection by SkyWest (76 seats: 12C@37”, 20W@34”, 44Y@31”)



E175 Air Canada (76 seats: 12C@38", 64Y@31")



E175 KLM Cityhopper (Single Class 88 seats: 8C@32", 20W@32", 60Y@29")



Source: AeroLOPA

2.1.2.2 CRJ700/900

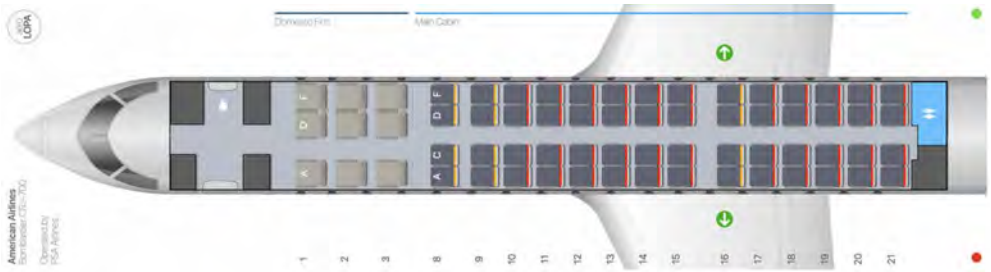
The table in Figure 2.5 shows the number of seats in each C, W and Y class on each of the aircraft operated on behalf of U.S. mainline carriers. The example LOPAs depict some of those in the table below and also includes a single class LOPA that is typical outside North America. A feature of many of the CRJs is that it is commonplace for the same CPA operator to provide a variety of configurations to the same mainline carrier. Apart from Mesa for United Express this is not the case with the E170/175 fleet.

In addition, there are also 49 CRJ700s with 50 seats (not shown) operated by another CPA provider GoJet on behalf of United Express. These are configured with 10 first class seats with a generous 42" pitch, 20 in premium economy at 34-36" pitch and 20Y at 30".

Figure 2.5: CRJ700/900 Seating Configuration

CPA Provider	Model	Operated For	No. Aircraft	First	First Pitch"	Prem Econ	Prem Pitch"	Econ	Econ Pitch"	Total Seats
SkyWest	CRJ700	American Eagle	86	6-10	36-37	12	35	44-52	31	65-70
SkyWest	CRJ700	Delta Connection	10	9	36-37	16	35	40-44	31	65-69
SkyWest	CRJ700	United Express	22	6-10	37-42	16	35	24-44	30	50-68
SkyWest	CRJ900	Delta Connection	44	12	37	20	34	44	31	76
PSA	CRJ700	American Eagle	61	9	37	12	35	44	31	65
PSA	CRJ900	American Eagle	81	12	37	24	35	40	31	76
Endeavor	CRJ700	Delta Connection	17	9	36	16	34	44	31	69
Endeavor	CRJ900	Delta Connection	127	12	37	20	34	32-44	31-32	64-76
Mesa	CRJ900	United Express	37	12	37	16	35	48	31	76

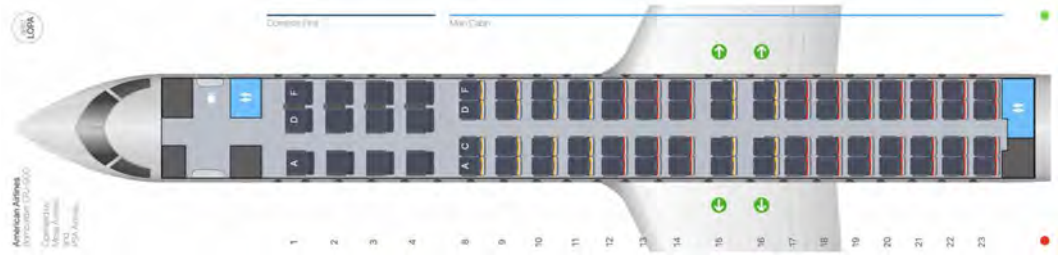
CRJ700 American Eagle by PSA/SkyWest (65 seats: 9C@37", 12W@35", 44Y@31")



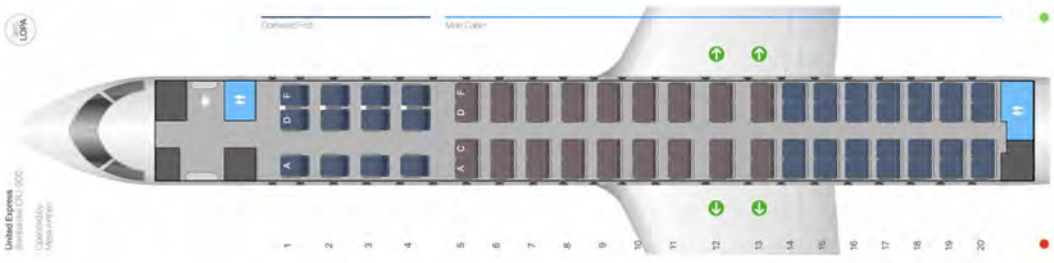
CRJ700 United Express by SkyWest (70 seats: 6C@37", 16W@35", 48Y@30")



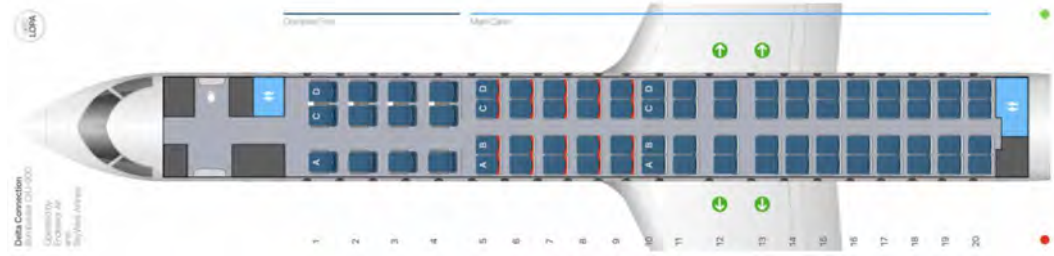
CRJ900 American Eagle by Mesa Airlines/PSA (76 seats: 12C@38", 24W@35", 40Y@30")



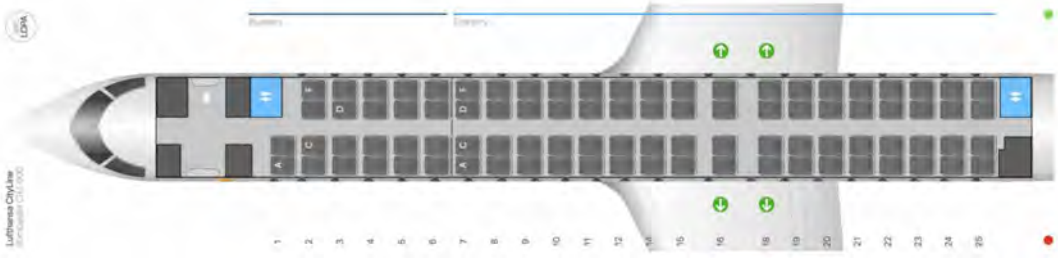
CRJ900 United Express by Mesa Airlines (76 seats: 12C@37", 16W@35", 48Y@30")



CRJ900 Delta Connection by Endeavor/SkyWest (76 seats: 12C@37", 20W@34", 44Y@31")



Lufthansa CityLine (Single Class 90 seats@31")



Source: AeroLOPA



TrueNoord Fleet
6 Embraer E170

Republic Airways

2.2 Principal Specifications & Weights

The principal weights and specifications of the E170/175 and the CRJ700/900 are shown in Figure 2.6 below.

Figure 2.6: E170/175 and CRJ700/900 Key Specifications

Variant	E170	E175	CRJ700/(550)	CRJ900
Length	29.9m	31.68m	32.3m	36.2m
Wingspan	26.0m	28.65m	23.2m	24.9m
MTOW (max)	38,600kg	40,370kg	34,020 kg(29,484kg)	38,329kg
Max. Payload	9,743kg	10,094kg	8,190 kg(7,051kg)	10,247kg
Engines (2x)	CF34-8E5	CF34-8E5	CF34-8C5	CF34-8C5
Range	2,150nm	2,200nm	1,378 Nm(2,200nm)	1,553nm
Take-off Distance*	1,151m	1,266m	1,516m	1,760m
Landing Distance	1,241m	1,261m	1,536m	1,632m
Max Pax Capacity	78	88	78 (50)	90

*Min Certified Take-off Distance (TOW for 500nm Range)

Source: Embraer, MHIRJ & CRJ APM & TCDS

Another measure to seating capacity can be seen in terms of the payload capability of each aircraft. The payload difference for the E175 is marginal at 150kg less than the CRJ900. If you assume an average passenger including luggage weighs 100kg the maximum passenger and baggage payload would be 8,800kg on an E175 and 9,000kg on a CRJ900. This means there is an excess baggage weight remaining on an E175 equal to useful 1,294kg (10,094kg-8,800kg). On a CRJ900 this is equal to 1,247kg which amounts to 47kg less although the CRJ900 includes 200kg of additional passenger weight at maximum passenger seating. On the E170 versus the CRJ700 the excess baggage margin is greater at 1,300kg for the former and 390kg for the latter.

Given that no aircraft in the largest market of North America has more than 76 seats (see 2.1.2) the excess baggage margin is in practice greater for all the subject aircraft. However, baggage capacity on any aircraft is also determined by volumetric capacity. This can be stowed in the cargo hold or in overhead bins. In the case of the E175 and CRJ900 the former has marginally more hold capacity at 17.12m^3 compared to 16.9m^3 whereas the E170 has nearly 1m^3 more capacity than the CRJ700.

However, it is the larger fuselage dimensions of the E-Jets that enable larger overhead bin capacity. Compared to narrowbodies where overhead bins can accommodate wheels first roller bags the regional aircraft typically can only take such bags sideways thereby reducing capacity per passenger. To date this applies to both the E-Jets and the CRJs. Despite improvements to CRJ bins in the newest retrofit 'Atmosphere' cabin, this gap is increasing with United's announcement that the overhead bins contemplated for the E175-E2 are to be installed on its SkyWest E175-E1 fleet that will enable wheels first roller bags.

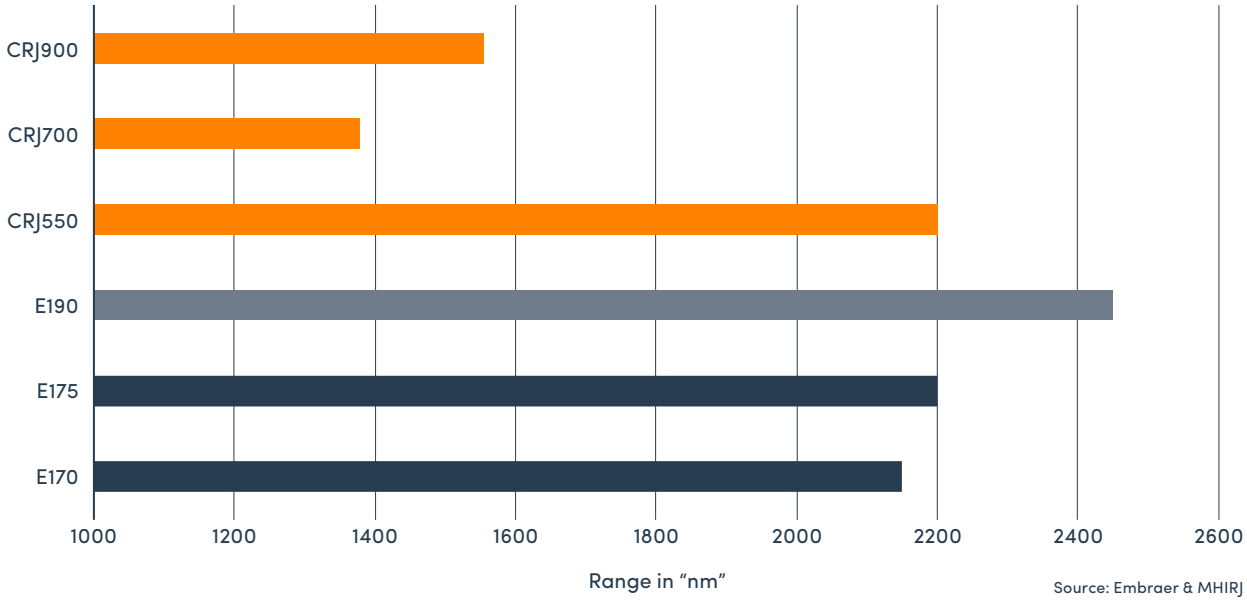
2.3 Engines

All CRJ models are powered by the CF34-8C5, whereas the E170/175 have the same engine with a slightly different CF34-8E5 nomenclature along with marginally different weights and dimensions. While there are several divergences between the engines on the CRJ and the E-Jet so that they cannot be interchanged, the main difference is that on the CRJ the engines are mounted on the rear of the fuselage as opposed to under the wings for the E170/175. Accordingly, the -8C5 mountings are located to the side instead of on the top for the -8E5. The engine dry weights differ at 1,261kg for the -8C5 and 1,428kg for the -8E5. The length and diameter of both models also differ slightly. The maximum thrust rating of both models is 14,500lb (6,577kg).

2.4 Range

While the CRJ family is a capable aircraft for most typical regional flights, its range is more limited than the Embraer, as shown in Figure 2.7 below. A mission capability exceeding 1,500nm, or around 3 hours, enables the aircraft to perform the vast majority of sectors that any airline may wish to fly and even in the large US domestic market most fly missions under 1,000nm. There will always be sectors in some locations where the longer range may add value such as some long North American routes. The 50 seat CRJ550 is more than adequately capable of the limited number of long sectors required for US operations as is the E175. (Note that the maximum range shown for the E175 is that of the more recent "+" variant that has improved fuel burn and therefore range capability, and the E190 range is only shown to illustrate the relative greater range of its larger sibling.)

Figure 2.7: E170/175 & CRJ550/700/900 Range Comparison in 'nm'



Source: Embraer & MHIRJ

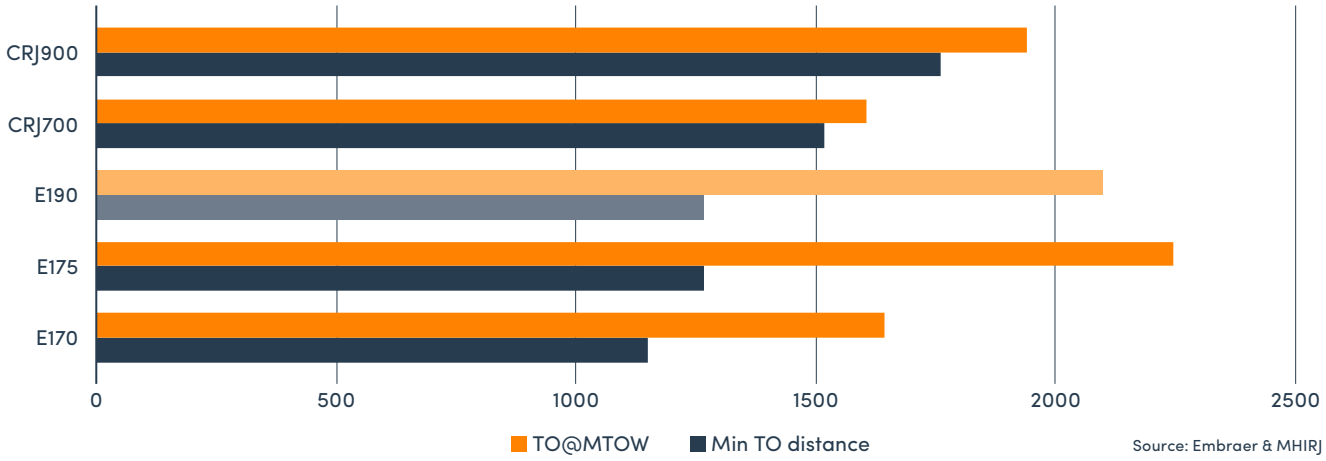
2.5 Performance

The ability to operate from restricted airports with short runways and/or obstacles is often a key attribute of regional aircraft. Typically, this favours turboprops over regional jets, but where turboprops are not optimal, strong airfield performance of regional jets finds applications notably at airports such as London City, or Florence, where mainline aircraft cannot be deployed. By way of a U.S. example where most of the subject aircraft operate, only the E175 and CRJ700 at SkyWest can operate at Aspen Colorado. In this case the challenge is high airport elevation and obstacle clearance (mountain proximity and a highway) rather than runway length.

In this context, the CRJ family was never designed with short field performance in mind. Its former owner Bombardier's position was that this was more the role of its Dash 8 turboprop product line. By contrast, Embraer, which to date has no turboprop product, designed the E-Jet to maximise its capability for short runway operations so that performance differences between the two types are quite evident as shown in Figure 2.8. This shows the minimum certified take-off distance and the field length required when the aircraft operates at MTOW. The differences in terms of climb performance where obstacle clearance is relevant are similar.

Currently, the E190 shows a similar take-off performance compared to the E175, which seems illogical given the lower weight of the latter. Embraer stress that since there has been little demand to operate the E175 at short field airports in the U.S. or elsewhere, the same efforts to improve certification for the type have not been applied to the E175 compared to the E190 which has had significant short-field performance demand.

Figure 2.8: E170/175 & CRJ700/900 Runway Performance – Takeoff Distance



Source: Embraer & MHIRJ

2.6 Economic Comparison

The constituents of operating costs, excluding the aircraft capital portion, are often referred to as cash operating costs (COC). The main elements that are driven by operating the aircraft itself are reviewed below. While crew costs are a major COC component these are assumed to be the same for all the aircraft under review and therefore do not materially impact the relative outcomes of each of the types under consideration. In practice, these may differ significantly between high and low labour cost regions, and between regional and mainline operators which will benefit those operated in regional entities that generally have lower crew salaries and costs. While navigation and landing charges are included in the COCs, these are not separately reviewed as these are largely driven by varying criteria including aircraft weight in many parts of the world.

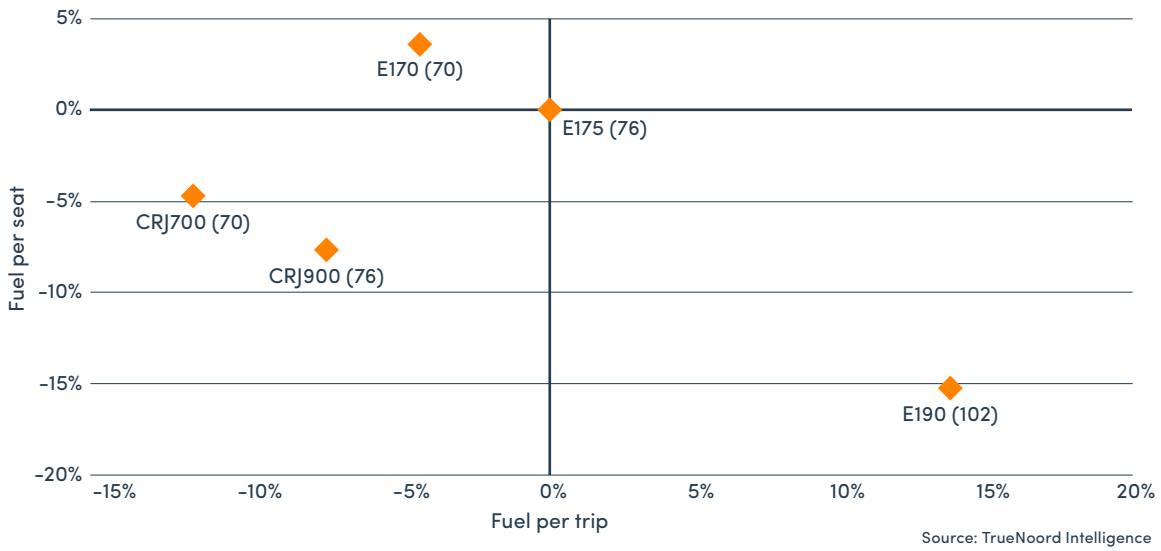
2.6.1 Fuel Burn

As mature aircraft types, the fuel burns of the CRJ700/900 and E170/175 are a relatively well-known quantity. For the types where both manufacturers have equivalent 76 seat capacity aircraft (CRJ900 & E175 in North America), the former will consume around 2,200kg of fuel on a 500nm trip or 29kg per seat. This compares to around 2,400kg for the E175 which equates to 32kg per seat. The slightly greater fuel consumption of the E175 is not surprising since it is a heavier aircraft that offers the benefits of its larger cabin and greater baggage capacity.

On a shorter 300nm sector the CRJ burns about 1,500kg compared to just over 1,600kg for the E175. This means that for the shorter sector, the gap in fuel efficiency between both aircraft narrows in both absolute and relative terms. On longer sectors of 700nm the gap widens but in relative terms remains similar to the 500nm sector.

The smaller CRJ700 and E170 burn marginally less fuel on the same trip, but more per seat compared to their larger siblings given their lower seat counts. The relative fuel burn of each type compared to the E175 is shown in Figure 2.9.

Figure 2.9: Block Fuel Burn relative to E175 (Dual Class 500nm trip)



Source: TrueNoord Intelligence

2.6.2 Maintenance/FH/FC

The CRJ and E-Jet families are both mature aircraft programmes. Therefore, a combination of OEM data, which has been cross checked with TrueNoord's own internal experience, has been applied. Consequently, the scheduled tasks and time intervals are reasonably accurate, but the associated costs are estimates, which have been slightly escalated to be conservative unless an actual published figure is used, as is the case with engine LLPs.

The principal scheduled maintenance tasks, intervals and estimated costs are as outlined in Figure 2.10 as follows. For ease of interpretation engine maintenance is divided into performance restoration and LLP replacements.

Figure 2.10: Maintenance Comparison CRJ700/900 & E170/175

CRJ700/900	E170/175
Airframe Base Maintenance	
Base maintenance is divided into a series of Flight Hour (FH) limited Basic / C checks and calendar time limited checks. In general, operators try to limit the number of heavy base maintenance visits to minimise both down-time and the opening of panels. Ideally, the FH and calendar interval of base checks are determined so that both would coincide. Assuming an annual average utilisation of 2,500-3,000 FH, this usually ensures optimal alignment. In the event that utilisation is lower, calendar checks would be needed earlier so that the full potential of FH life cannot be used. Conversely, if utilisation is higher then some calendar time may not be used in order to achieve check alignment.	
The airframe C-check interval is currently 8,000FH for both variants having been escalated from 6,000FH several years ago. In addition, there are calendar time checks at 6, 9 and 12 years. Assuming a utilisation of around 2,500+ hours per year, the 6-year check would align with the second C-check. TrueNoord estimates the average cost of a C-check to be approximately US$60 per FH. This is a useful guide but may vary according to findings and manhour rates. The calendar checks are expected to add about US$4,800 per month to the base check reserve rate In addition, there is a 40,000FC structural inspection adding around US$5 per FC.	The airframe basic check (C-check equivalent) remains at 7,500FH for all models. In addition, there are calendar time checks at 6, 8 and 10 years. Assuming a utilisation of 2,500 hours per year the 6-year check would align with the second basic check, but alignment of the basic check with the 8-year check would then be out of phase. The average basic check cost is estimated to be in the region of US$70 per FH for the E170/175. This may vary according to findings and manhour rates. All the calendar time-based checks and costs apply equally to all E170/175 models. The calendar-based checks at each base check are expected to add an additional US$3,500 per month to the reserve rate across all calendar checks. In addition, there are 20,000FC and 40,000FC structural checks adding around US$7 per FC.
Landing Gear	
Overhaul limits are 20,000FC or 12 years, whichever occurs first. The expected overhaul cost is in the region of US$30 per FC.	Overhaul limits are 30,000FC or 12 years whichever occurs first for the E170/175. The expected overhaul cost is in the region of US$20 per FC for the E170/175.

CRJ700/900	E170/175
Engine Performance Restoration (EPR)	
As a mature engine platform, all the CF34-8C5/E5 engines are on-condition, but typically require their first EPR between 12,000 and 14,500FC and at roughly 10,500FC intervals thereafter in a relatively benign environment and earlier in a hostile climate. This applies equally to the CRJ and E-Jet models. There are also higher thrust A1 variants with a shorter LLP life and EPR interval. The second shop (SV) visit will be an EPR caused by the necessity to replace the LLPs.	
The first run EPR event cost is in the region of US$140 per FC (2025$) for both families. This would apply to many E175s, but as the CRJ700/900 and the E170 are ageing and out of production aircraft, the majority of EPRs would now be second run events. Each such second SV would be expected to considerably exceed the cost of the first SV. The EPR element of the second run SV would cost in the region of US$210 per FC.	
Engine Life Limited Parts (LLPs)	
Most CF34-8C5/E5 variants have LLP lives of 25,000 FC except for 2 LLPs which have a slightly lower limit of 24,100 FC (which effectively becomes the limiter creating some wasted stub life on the rest). Each engine also has a static LLP which has a longer life of 41,000FC; these are also the most expensive individual LLPs. However, some higher thrust rated variants (CF34-8E5A1 and -8C5A1/2) have shorter LLP lives of 20,000FC for the high-pressure turbine section. For the CRJs and E170/175 the -8 engines have high LLP replacement costs in the region of US$160 per FC based upon a 25,000 FC rotating LLP life excluding static LLPs. The A1/A2 variants with lower LLP life, therefore, have a higher cost exceeding US$200 per FC.	
APU	
The APU interval on the CRJ ranges from 8,000 to 12,000 (first run) APU hours. The expected overhaul cost is in the region of US$40-45 per APU hour.	The APU is the same across all E-Jet models and is expected to require a performance restoration between 7,000 and 12,000 (first run) APU hours. The expected performance restoration cost is in the region of US$45-50 per APU hour.

Source: TrueNoord Intelligence

Comments on Maintenance

The above maintenance costs and intervals are based on fixed intervals except for engines and APU, which are maintained on-condition. The actual maintenance costs will vary considerably according to how the aircraft are operated and the environments in which they fly.

Regarding engines in particular, there is considerable disparity between benign and inhospitable climates. Hot and high operating conditions will cause more stress on engines and reduce the intervals between EPRs. Similarly, high humidity; sandy/dusty airports or areas with high pollution levels also negatively impact engine SV intervals. The cost estimates above assume a relatively benign European operating environment.

Furthermore, since many 70-seat Regional Jets have been in operation for over two decades, obsolescence is creeping into the older fleets. For the 70-seat Embraer fleet support of older aircraft is easier as the E175 remains in production. For the ageing CRJ fleet OEM support is gradually becoming more challenging. For example, support for its Rockwell-Collins avionics suite is in doubt so that this may require replacement at significant cost.

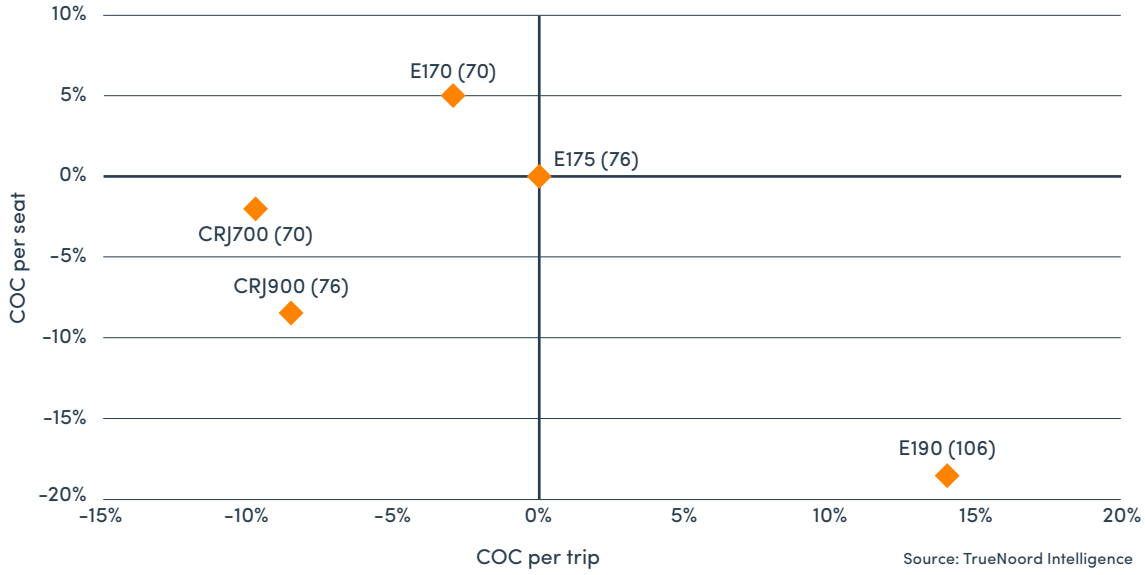
The estimated costs in Figure 2.10 are based upon prices applicable for events in 2025.

2.7 Economic Comparison Overview

Figure 2.11 below compares the principal cash operating costs (COCs) per month (assuming around 200 trip sectors/mth) of the highlighted regional jets with each other. This suggests that in general, the COCs of the CRJs are slightly below those of the E-Jets, which, given their lower operating weights, is unsurprising. However, in practice, the larger E-Jet cabin means that it is increasingly preferred by operators in the 70-90 seat category. In the larger category, the E-Jets have greater trip costs but lower seat costs. Although most of the CRJ700/900 and E170/175 aircraft operate in North America, for consistency with previous type reports the costs assume a European environment with associated weight related charges in relation to navigation. However, since most aircraft operate in North America the typical seating configurations in that market are applied. For comparison consistency with previous reports, the fuel cost assumption also remains as before, despite recent cost volatility. Given the scope of the comparison between the different regional jets only, any fuel price changes affect all types similarly.

The analysis of differences in the operating costs that do not relate to specific aircraft types (cockpit crew scheduling and costs, airport handling charges, line maintenance) have been cursory in this report. However, some of these elements can make a material difference if there is discrimination between types. For example, Schiphol airport in Amsterdam has introduced revised airport charges in 2025. Their impact will be fees per rotation for KLM Cityhopper's E175 fleet of EUR1,500 per rotation, compared to EUR550 for the larger E195-E2. This could materially impact the viability of its E175 operations.

Figure 2.11: Relative Cash Operating Costs in US$/mth (500nm at US$0.68/kg fuel)



Source: TrueNoord Intelligence

Previous type reports included a comparison of Direct Operating Costs (DOCs), which included the monthly cost of each of the relevant aircraft. These showed a mix of new generation and current generation widely in service types so that the greater capital cost of new types often cancelled out, or in some cases, made the DOCs of new aircraft greater than used examples. In the main North American market there is a larger than average variety of new and used examples, so the relative DOCs are not shown.

2.8 Emissions

After the pandemic hiatus, aircraft emissions have returned to the forefront as a major industry concern second only to the ongoing industry supply chain related difficulties.

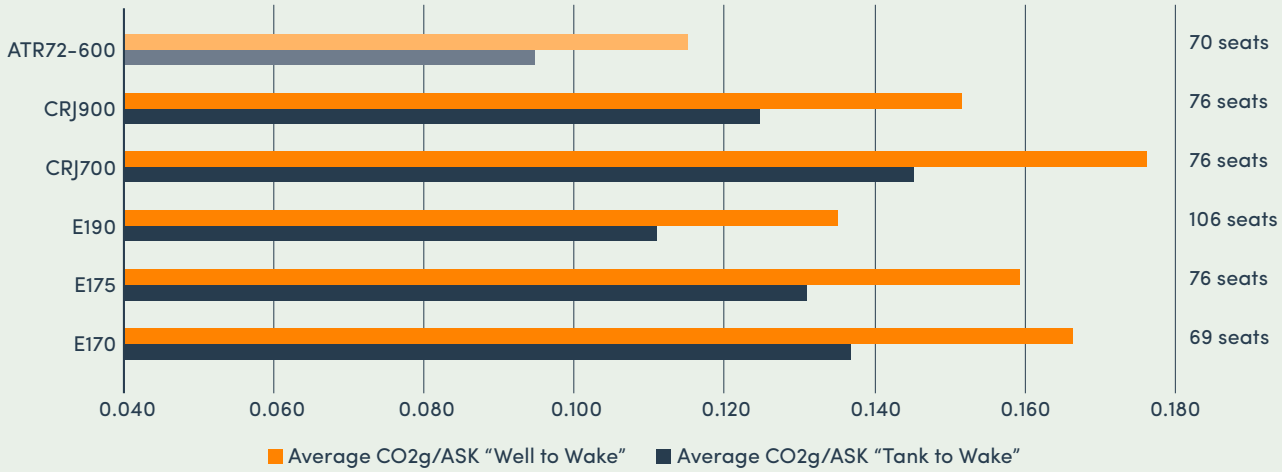
As the principal concern relates to CO2 emissions, Figure 2.12 shows carbon emissions for the subject aircraft on a per available seat per km (ASK) basis over a 500nm sector. For each aircraft the number of seats from which the per seat calculation is derived is also shown. Carbon emissions are a function of fuel burn. For each kg of fuel consumed, a generally accepted multiplier of 3.16kg of C02 per kg of fuel is applied (Source: ICAO). This more common so-called "tank-to-wake" method does not account for emissions related to extraction, refining and distribution of fuel to airports so that a more complete "well-to-wake" approach is also shown.

To show how the subject regional jets compare to other classes of aircraft, the equivalent emissions for the larger E190 with 106 seats and the most common similar capacity turboprop (ATR72-600) is also shown in Figure 2.12.

Unsurprisingly, the largest capacity aircraft shown (E190) has the lowest emissions per seat. By contrast, the smaller ATR72-600 turboprop remains the lowest emission aircraft of any under consideration. The fuel burn, and therefore emissions for turboprops have always been substantially better than the equivalent regional jets over short to medium sectors.

However, the 500nm sector shown in Figure 2.12 is relatively long for a turboprop especially the ATR72 as the journey time is close to 30 minutes greater than for any of the jets generating a flight time of around 2 hours. For such journeys and longer sectors up to the maximum range of the ATR (approx. 700nm), the turboprop increasingly suffers from poor passenger perception especially if a competing jet alternative operates the same route. Thus, for longer thin routes that are more common in markets such as North America, the jets are almost always preferred. Furthermore, as the sector length increases, the fuel burn and thus the emissions gap between the jets and turboprops erodes because of the greater flight time difference.

Figure 2.12: Regional Jet CO2 Emissions in kg per Seat per km (500nm Sector)



Source: TrueNoord Intelligence & IBA Insight Insight



3 Market Review

Whilst all previous TrueNoord market reports for any category of regional or small narrowbody aircraft portray a global view, the subject 70 seat category is so dominated by the North American market that much of the following commentary relates to that region. Of some 1,750 active and stored aircraft in the subject 70 seat segment, over 1,400 (81%) are deployed in North America. Europe is the next largest market with only 8% of the global fleet.

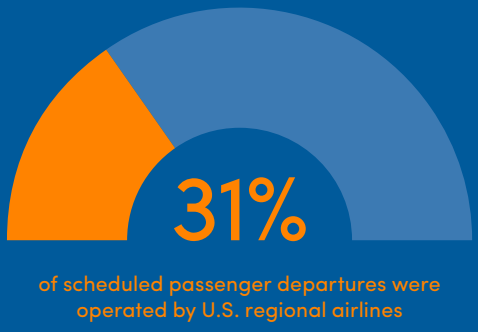
3.1 Deployment of 70-seat Regional Jets

3.1.1 Applications

To understand the position and demand for regional jets in the short-haul air transport ecosystem the role of this gauge of aircraft can be summarised as follows:

- Providing air service between cities where passenger demand is insufficient for larger aircraft. In the US, such services are predominantly provided by regional jets. Although the proportion of services in the U.S. provided by regionals cited in Figure 3.1 includes 50-seater regional jets and turboprops of all sizes, the average seating capacity of regional aircraft is now close to 70 seats. The Regional Airline Association (RAA) data also indicates that an increasingly large proportion of services are provided by the subject aircraft category. Compared to other markets including Canada where such routes are served by either jets or turboprops, there remain few 70 seat category turboprops in the USA.

Figure 3.1: US Regional Airline Services in 2023



Source: Regional Airline Association (RAA) Annual Report 2024

- Connecting cities to remote communities where a public subsidy is required to make any service viable. In Europe and most other parts of the world outside the U.S. most such services are provided by turboprops. In the U.S. there are 112 essential air service (EAS) routes outside Alaska of which 70 are provided by jets. Currently nine of these are provided by 70-seat Regional Jets including CRJ550s. As the 50-seat regional jet fleet continues to age, many of these will need to be served by 70-seaters instead.
- Serving locations with airports that have short runways or obstacles where larger aircraft cannot operate. This is a known constraint outside North America in cities such as London City Airport or Florence but also features in North America notably at Toronto Billy Bishop which historically could not accommodate regional jets and still does not allow them following a runway extension. In the US this is only prevalent at some smaller airports such as Hilton Head Island off the coast of South Carolina which cannot be served by aircraft bigger than 70-seat Regional Jets. Services are also limited to aircraft no larger than 70-seat Regional Jets at some high-altitude airports such as Aspen, Colorado.
- Connecting markets where frequency is important, but where larger aircraft could only provide limited regular flights.
- Providing lower levels of off-peak capacity between cities such as middle-of-the-day services or low season connectivity. This is common practice in North America.
- Enabling airlines to offer flexible capacity levels on short to medium haul routes according to passenger demand by interchanging regional jets and narrowbodies.
- Facilitating new route development. A lower capacity regional jet offers major airlines a lower risk way of proving a new route until it becomes more established and merits the deployment of larger capacity aircraft.

Increasingly, regional jet operations have become integrated into the networks of major airline networks over the last two decades. (See 3.1.2 Business Models.) As such their role is greater than serving the specific point-to-point operations described below. North American major carriers have developed hub and spoke systems that materially rely on feeding traffic to a large network of both short, medium and long-haul connections. (European carriers also have extensive hub and spoke operations but these tend to be more focused on connectivity to their long-haul services. Middle East and Asian airlines' hub and spoke business models rely more on long-haul to long-haul feed).

Regional Jets provide an increasingly important proportion of passenger feed to such carriers' networks.

There can also be defensive reasons for deploying regional jets in times of constrained demand. If an airline needs to protect its slots at congested airports, regional jets can enable them to use the slots while reducing capacity. This was a common tactic in the 2008 financial crisis in the US, which included their deployment on popular shuttle routes between Boston and New York.

The points above can be illustrated by the typical route network examples for two of the largest U.S. regional operators shown in Figure 3.2 below. SkyWest, and Republic Airways each operate for US majors. Both show the domination of connectivity from secondary cities. SkyWest serves major hubs from 21 bases on behalf of all three majors and Alaska on the west coast. In the case of Republic, a greater proportion connects secondary east coast cities to major hubs including Chicago and New York.

Outside North America, Lufthansa CityLine and KLM Cityhopper are the largest operators of 70 seat regional jets. Lufthansa CityLine continues to operate CRJ900s on its network to serve smaller cities from its main hubs in Frankfurt and Munich. Alongside its fleet of E190s (E1 & E2), KLM Cityhopper deploys a fleet of E175s to serve its thinnest routes and some off-peak services.

In Asia, China Express operates CRJ900s, but is seeking to dispose of these aircraft and E170/175 are active in Japan across both Fuji Dream and J-Air to serve secondary destinations. Elsewhere only small numbers operate, mainly in Africa.

Figure 3.2: Regional Jet Networks of SkyWest & Republic Airways for US Majors



Source: SkyWest & Republic Airways

3.1.2 Business Model

Most 70-seat Regional Jets are not only flown on applications that differ to larger regional jets and narrowbodies, but also on different business models. The key difference to mainline carriers is that most 70-seat Regional Jet operators do not sell seats directly but provide capacity to airlines on a cost-plus basis and earn the same revenue per flight irrespective of load factor or yield. They therefore assume no commercial risk.

Whilst the detailed contractual terms of arrangements between regional and mainline partners are outside the scope of this report, they are designed to benefit from certain operating cost advantages at regional partners (primarily lower crew costs) while optimising the economies of scale available to major airlines and their more favourable cost of funding.

There are some standalone airlines that operate 70-seat Regional Jets, but as a proportion of the total fleet the numbers are small (<7% of the total 70-seat regional jet fleet).

The principal business models applicable to 70-seat Regional Jets are as providers of capacity to major airlines. This can be done in four ways:

- **Capacity Purchase Agreements**

  A CPA agreement is typically a long-term contract for a period of at least five years (many exceed 10 years) between a major airline and a regional carrier under which the regional airline provides aircraft capacity to the major over the term of the agreement. The services provided by the regional always include the aircraft and crews and may also include maintenance and insurance depending on the agreement with the major. In most cases maintenance services are also provided by the regional operator, but there are examples where the major provides MRO support although line maintenance is always the responsibility of the regional partner. Typically, the regional airline provides all required liability and hull insurance, but some CPAs include provisions where the major assumes at least some of the insurance risk. In this sense, many CPAs are equivalent to ACMI contracts, but not always. In most other respects CPA agreements are more comprehensive than ACMIs.

  CPA agreements are the most common business model in North America and cover the vast majority of 70-seat Regional Jets. Globally 81% of such aircraft operate under CPA contracts (Fig. 3.3) and the main operators are those shown in Fig 2.4 and 2.5. Jazz operates to a similar CPA model in Canada.

- **Aircraft Crew Maintenance & Insurance (ACMI)**

  More common outside North America, ACMI agreements typically have much shorter terms than CPAs. Some are for peak summer season requirements only and year-round contracts beyond 3-5 years are unusual. The benefits of this approach to each partner are similar to CPAs. However, the shorter term derisks the agreement for major airline partners and increases the downtime risk for the regional partner. One of the only ways to mitigate this risk for ACMI operators is to minimise fixed costs by operating older generation less expensive aircraft and another is to fly for multiple major airlines.

  ACMI agreements as a tool for the provision of capacity are more common in Europe although mainly for larger regional jets and mainline aircraft. In the 70-seat Regional Jet category CityJet provides capacity to SAS under such contracts and the recent Strategic Alliance of Regional Airlines (SARA) with Air Nostrum is aimed at both diversification of their respective customer bases and increased scale.

- **Wholly Owned Subsidiaries**

  In some instances, network airlines have established their own wholly owned subsidiaries to operate regional aircraft on behalf of their parent companies. After CPAs this is the most common way of operating regional jets of any size including 70-seat capacity. This approach represents about half the aircraft capacity outside CPA agreements or about 10% of the total 70-seat Regional Jet fleet. (Fig 3.3) These subsidiaries typically have separate staff contracts to the parent companies and different maintenance agreements applicable to the relevant aircraft types. These subsidiaries manage operations, but all commercial functions of sales and distribution rest with the mainline. Aircraft procurement is also usually managed by the parent company.

  Wholly owned subsidiaries are more common in Europe and include KLM Cityhopper and Air France HOP! In some cases, North American CPA providers are also wholly owned subsidiaries as is the case with Envoy owned by American. Arguably such examples could be included in this category.

- **Franchise Agreements**

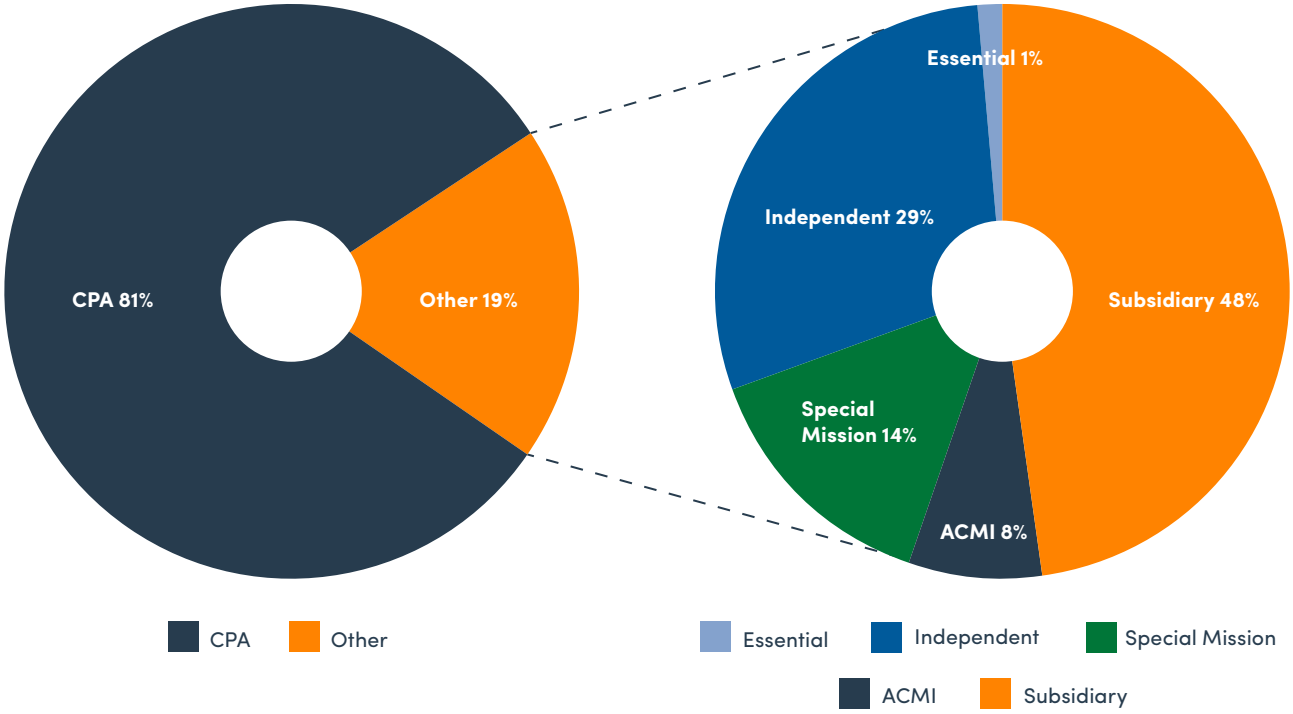
  To secure regional airliner capacity some major airlines have developed franchise agreements with independent regional carriers whereby regional routes are flown by such partners using the brand and sales distribution capability of the major. The difference to ACMI or CPA is that the franchisee remains responsible for revenue and profitability even though it does not fully control sales and distribution. If inappropriately structured such agreements can cause conflict between the partners if the revenue management functions of the major do not enable the regional partner to generate adequate returns. There are examples of such agreements leading to the demise of franchises.

  However some, notably Air Nostrum's franchise agreement with Iberia, has thrived since its inception in the late 1990s. Air Nostrum has operated CRJ900s, but has recently transitioned to the larger CRJ1000 model.

For the remaining aircraft not included in any of the previous business models some operate in special mission roles as charter carriers for large corporates or sports teams. Others operate as small independent regional airlines. Both categories account for about 7% of the 70-seat Regional Jet fleet. (Fig 3.3).

Government-supported essential air services or public service obligation applications are typically performed by turboprops and very often with a 19-50 seat capacity. There are few exceptions to this although Star Air in India which recently took delivery of E175s operates state supported routes under the country's UDAN scheme. In the dominant U.S. market there are also a small number of EAS routes (See 3.1.1) provided by 70-seat Regional Jets. These are predominantly provided by SkyWest on CRJ550/700/900 aircraft on seven of nine routes from Minneapolis, Detroit and Chicago. American operates a single EAS route from Dallas with CRJ700s.

Figure 3.3: 70-seat Regional Jet Business Models



Source: Cirium & IBA Insight

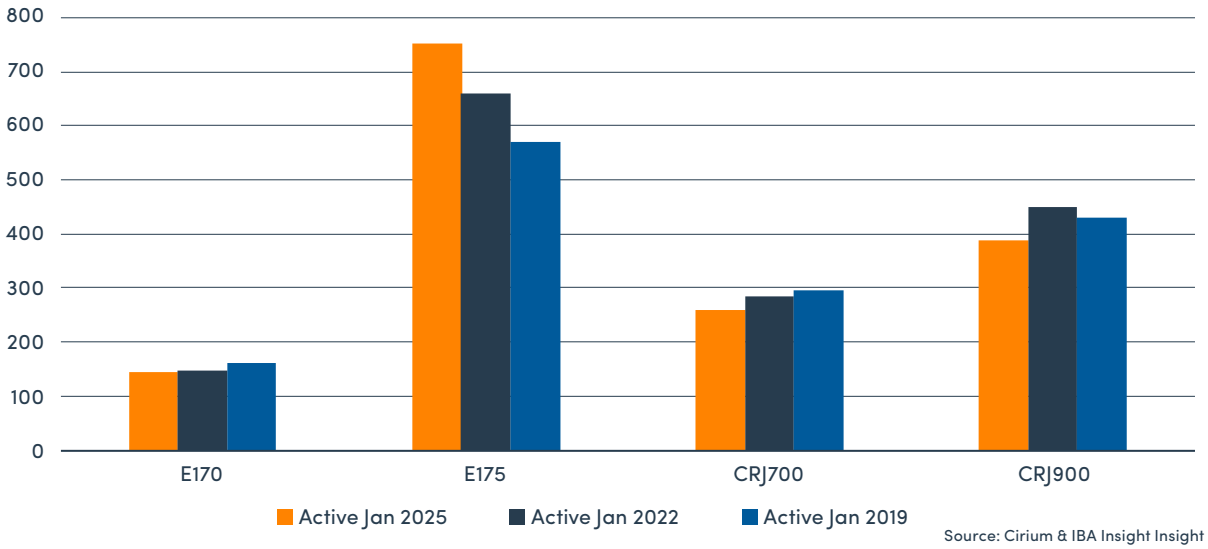
3.2 Numbers in Service Update

The total number of active 70-seat Regional Jets under examination now exceeds 1,500 aircraft of all models and this fleet size has remained stable since 2019 with modest overall growth of around 100 units. However, there has been significant evolution over time in composition in favour of Embraer largely in relation to the growth of the E175 fleet over the period since early 2019. This fleet has grown by nearly 200 units, while the CRJ700/900 types have shrunk by about 100 examples.

The E175 at 760 is the most common variant followed by the CRJ900 at just over 400. The actual number of each type of aircraft in service, shown in Figure 3.4, varies slightly according to the source data. The differences amount to between 10 and 50 aircraft of each type, which historically reflected the fact that no database is 100% accurate. However, in the current climate which remains impacted by the effects of the COVID-19 induced supply chain constraints, the differences are greater than before and relate primarily to how many aircraft of the total fleet of each aircraft type are classified as stored or parked.

None of the data sources used by TrueNoord including Cirium, the IBA or ch-aviation, are completely consistent in their assessment of grounded aircraft numbers as their respective definitions of stored or parked units are not identical. Furthermore, a number of aircraft are classed as stored when they are only temporarily out of service. The direct COVID-19 effect has reduced since 2021, but an above long-term average continues to be temporarily stored because of constrained MRO capacity and parts shortages from OEMs. Accordingly, TrueNoord Insight has adjusted the stored aircraft category to remove those that are obviously temporarily stored, and added these to active units to more accurately reflect aircraft that are parked for the reasons that have prevailed in recent years. However, this adjustment will not have been completely accurate either, and some will have remained classified as stored but only temporarily. It is therefore not correct to infer that stored aircraft is a proxy for available aircraft.

Figure 3.4: Active 70-seat Regional Jets in Jan 2025, 2022 & 2019



Source: Cirium & IBA Insight Insight

From a leasing perspective, the number of E175s and CRJ900s in service represents a significant critical mass of aircraft sufficient to render both variants attractive leasing candidates. This is more restricted for the other types, which consequently might be considered less attractive. However, as discussed in section 4, leasing of 70-seat category jet aircraft is less prevalent than other larger regional jets, as aircraft in the US market are typically financed by other means.

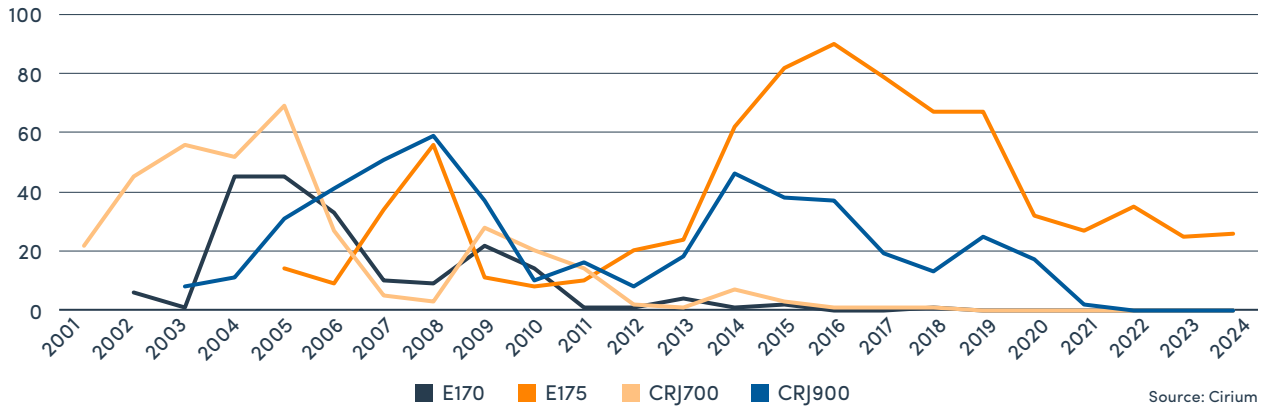
3.3 Delivery Profile

The delivery profile of regional jets is an important consideration for lessors as it enables the age of their aircraft to be compared with the total population of aircraft manufactured. Traditionally, more recent vintages have been considered more attractive to the used market, so a relatively young fleet should facilitate easier future placement opportunities.

However, this is not universally true, particularly in times of depressed demand. In periods such as the pandemic, lease rates for available aircraft fell towards levels where the premium for more recent vintages eroded. Older mid-life 10–15-year-old vintages also have cost advantages. Their longer depreciation time and lower associated book values can make them more attractive to a price-conscious secondary market, provided that their maintenance condition, particularly in relation to engines, enables them to be operated without major overhauls for a period of at least two years.

As shown in Figure 3.5, the smaller E170 and CRJ700 delivery profile peaked in the early production years and then trended downwards rapidly thereafter. Some of the capacity demand for this size category was then replaced by the slightly larger E175 and CRJ900, which had its first peak in 2008. Both the CRJ900 and E175 had a more recent recovery from 2013 and reached a new peak in 2014 and 2016 respectively. This satisfied demand from the US market for scope clause compliant aircraft to replace many of the incumbent 50 seaters. The last CRJ900s were delivered in 2021 and E175 production has continued at a level of around 30 aircraft each year. A backlog exclusively for US carriers remains for the E175, which will require a similar annual production rate for most of the remainder of the decade.

Figure 3.5: 70 Seat Regional Jet Delivery Profile

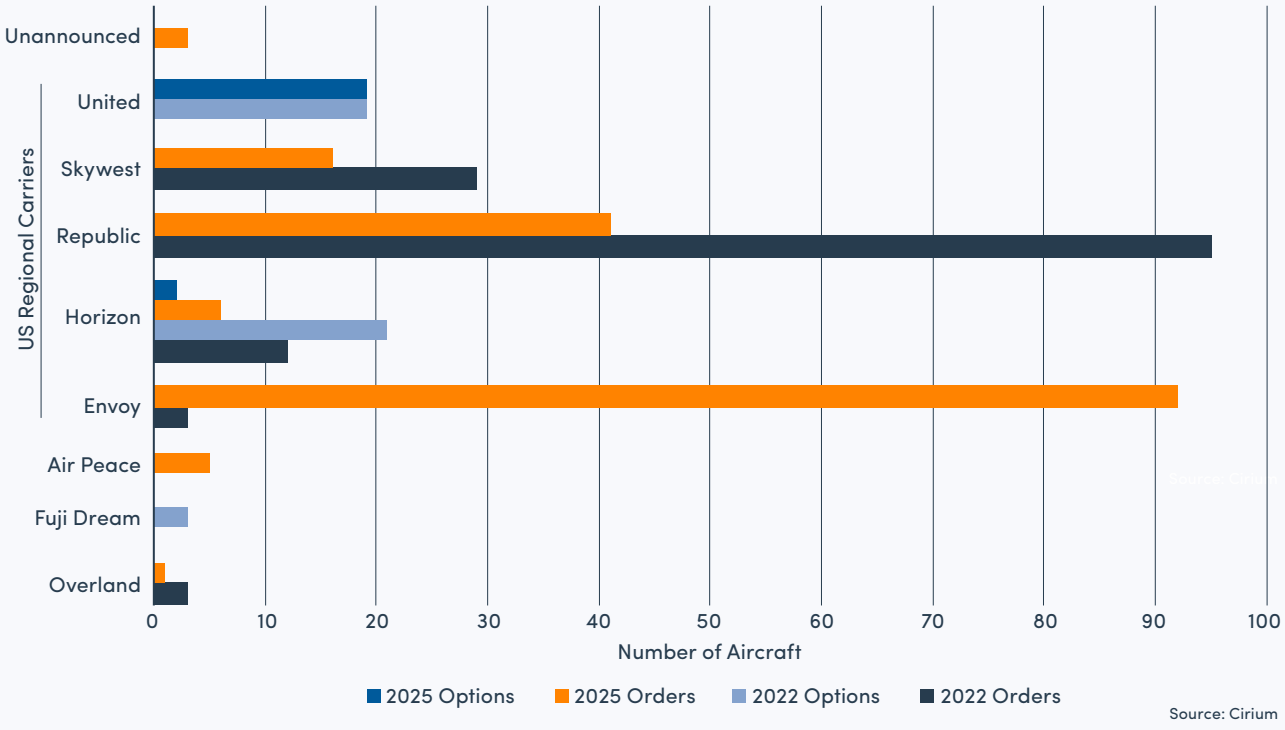


Source: Cirium

3.4 Firm Order Backlog

Production of all the subject aircraft except the E175 has ceased so that the order backlog applies to this type only. The official E175-E1 generation orderbook backlog stands at 142 aircraft with an additional 43 aircraft on option. This relatively robust order book primarily reflects ongoing demand from US regional carriers and is shown in Figure 3.6.

Figure 3.6: E175 Firm Order Backlog



Source: Cirium

Production of new CRJs has ceased with the last CRJ900 delivered to Jazz in 2021 and the last CRJ700s in 2018. MHIR has no plans to recommence production and will only support the existing fleet.

At Embraer, the continued relatively strong interest in the existing E175 product reflects:

- The monopoly position that the aircraft now occupies since the cessation of CRJ production; and
- The continued constraints imposed by North American scope clause agreements. These limit both the capacity of regional jets that can be deployed to 76 seats and the maximum take-off weight of the aircraft permitted. Embraer had hoped to introduce the E175-E2 to this market, but its geared turbofan engine renders the aircraft too heavy to meet scope clause requirements.

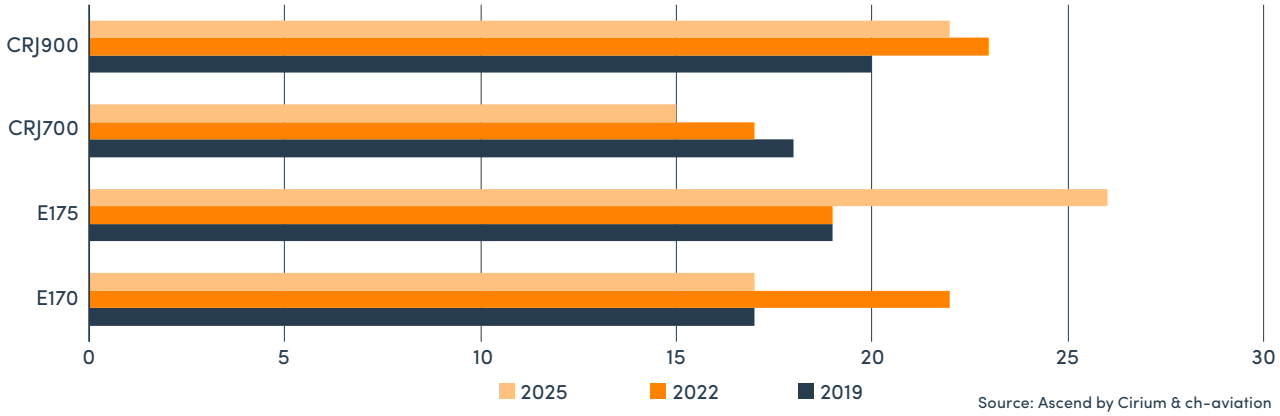
However, growth in the US regional market may continue to be limited by the availability of suitably qualified (ATPL rated) flight crew. Although recent reports suggest that crew shortages are easing most U.S. airlines believe this to be short-term relief only. The age profile of existing crews is such that there will be a wave of retirements over the coming years so that shortages will increase from 2026 onwards. Historically, the regional market has served as an entry level for a large proportion of flight crews and this has affected the regionals through increased levels of churn to mainline airlines. Efforts to mitigate this include Republic's training academy from which newly qualified crews first fly turboprops at Cape Air to accumulate sufficient hours to transition to regional jets.

3.5 Number of Regional Jet Operators

The absolute number of operators of any particular aircraft type is a vital determinant of its suitability as a leasing product because it is a prime driver of liquidity by showing the number of operators that could absorb additional incremental aircraft to their existing fleets.

As shown in Figure 3.7, the number of CRJ700 and E170 operators has declined since 2022 but has remained more stable for the CRJ900 and increased for the E175.

Figure 3.7: Number of 70 Seat Regional Jet Operators in 2019, 2022 & 2025



Source: Ascend by Cirium & ch-aviation

New regional operators in the growing E175 fleet largely comprise smaller carriers outside North America although the U.S. is also the region where the fleet has grown most with existing airlines expanding. North America has added two corporate operators with two and a single unit respectively. Similarly, Asia Pacific has added one corporate use example and Star Air has become the type's first foothold in India. Africa has seen the largest growth by number operators with three new airlines including: Mauritania Airlines; Overland Airways and Cronos. Europe has also added AeroItalia with a single example. In Latin America Sky High and Bermudair have each taken delivery of two examples.

With respect to the ageing aircraft types, the E170 has added a single aircraft for corporate applications in North America. In the case of the CRJ700, InterCaribbean has become a new operator with a single unit and a single aircraft has transitioned into the US for sports team transport. For the CRJ900 ValueJet in Africa is a new customer since 2022 although it already operates the CRJ700.

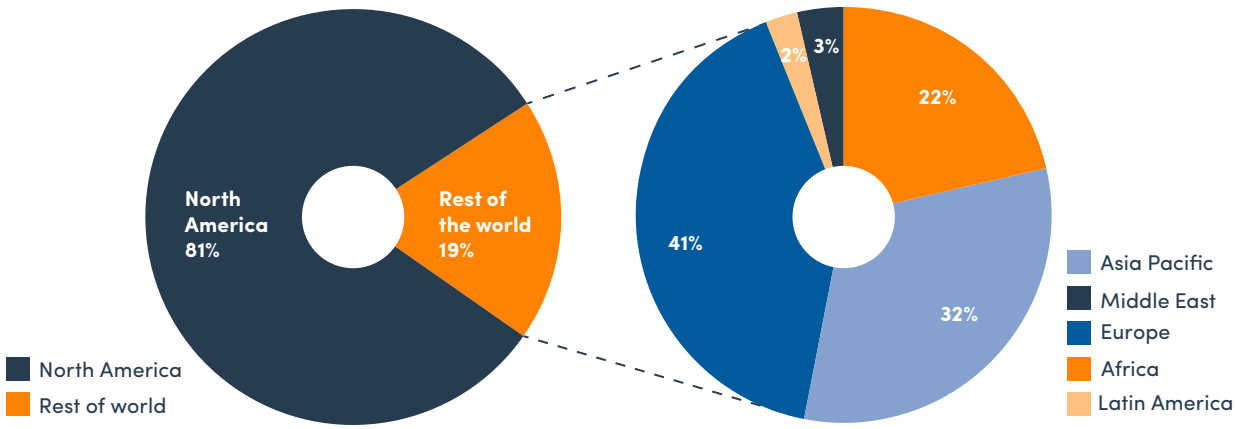
3.6 Geographical Dispersion

From a lessor perspective, a wide geographical distribution is desirable since this not only underscores the versatility of regional jets but also assists market liquidity and placement opportunities in the secondary market. Furthermore, a wide geographic dispersion ensures access to local crew training facilities, maintenance facilities, spare part stocks and trained staff. Often, if a type falls out of favour in one region this can affect several operators in the same area, so that the ability to place used fleets in other regions is important.

Ever since regional jets were first produced, their main market has been North America, and this remains the case in 2025 with over 80% of all 70-seat Regional Jets (Fig 3.8) and approaching 60% if larger regional jets and small narrowbodies are also included. In North America, where distances are long and smaller cities are often poorly connected to larger centres by alternative transport modes, there is a much larger number of smaller local airports compared to Europe or Asia. These enable the fastest connectivity to the main east and west coast urban centres, as well as more central hubs. This creates a level of demand for smaller capacity aircraft that either does not exist elsewhere or is only slowly developing in emerging economies.

By contrast, regional airport infrastructure is far more constrained in Europe due to both national fragmentation, more developed rail networks, and the increasing focus on environmental concerns. In Asia Pacific the primary market for 70-seat Regional Jets is Japan with Fuji Dream and J-Air serving thinner routes.

Figure 3.8: Global Geographical Distribution of 70 seat Regional Jets in Jan 2025



Source: Cirium & IBA Insight

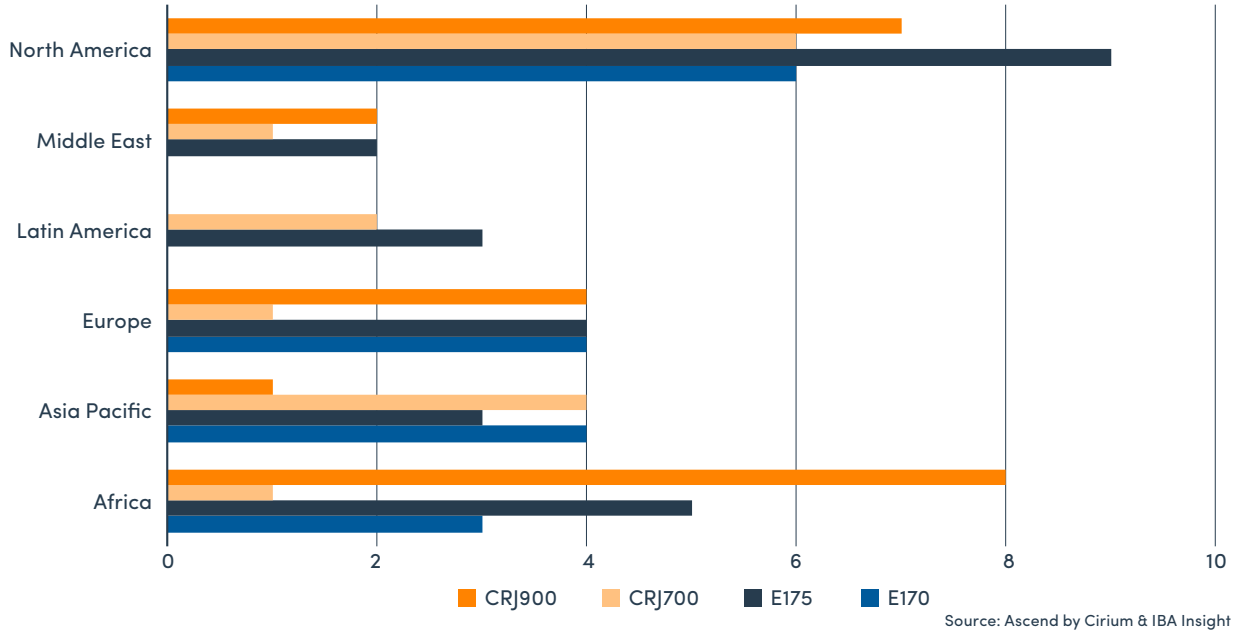
The primary driver for the prevalence of the 70-seat Regional Jets in North America is not so much a demand for the capacity they offer, but the constraints of scope clauses which prohibit larger regional jet operations by the capacity providers to US major airlines. Despite decades of hope that scope clauses might be relaxed, there has been almost no progress towards this end over the last decade and no changes are expected in the foreseeable future so that scope protects this size category very effectively into the future.

Whilst scope constraints can help maintain and grow the 70-seat Regional Jet market, other factors including increased congestion at major airports and environmental regulations could have the effect of squeezing such aircraft out of certain major airports. (This can also affect turboprops of a similar size such as the potential move by Manila airport to ban turboprops.)

In Europe, there are early signs that some airports may be adopting strategies to penalise 70-seat Regional Jets by imposing disproportionately high landing charges on such aircraft. The first mover on this is Amsterdam Schiphol, which has announced increased airport fees from 2025. (See section 2.7.) This includes increased noise-related charges that penalise the E175 so that the airport charges per passenger are three times greater than those applicable to the E195-E2. As KLM Cityhopper is the largest operator of the type in Amsterdam this could impact the future of its E175 operations. If other airports follow, this could reduce the 70-seat Regional Jet fleet in Europe. Since demand is strong, any surplus in Europe would probably be absorbed mainly in North America thereby increasing geographical concentration.

An alternative measure of geographical distribution would be by number of operators in each region (Fig 3.9). Although this shows a more even global spread, the average size of operators outside North America is under 10 aircraft of any one type whereas the fleet of the single largest North American operator is larger than the entire fleet outside that region. (SkyWest has 262 E175s yet only 108 are in service outside North America.)

Figure 3.9: Geographical Dispersion of Regional Jet Fleet by Number of Operators in Jan 2025



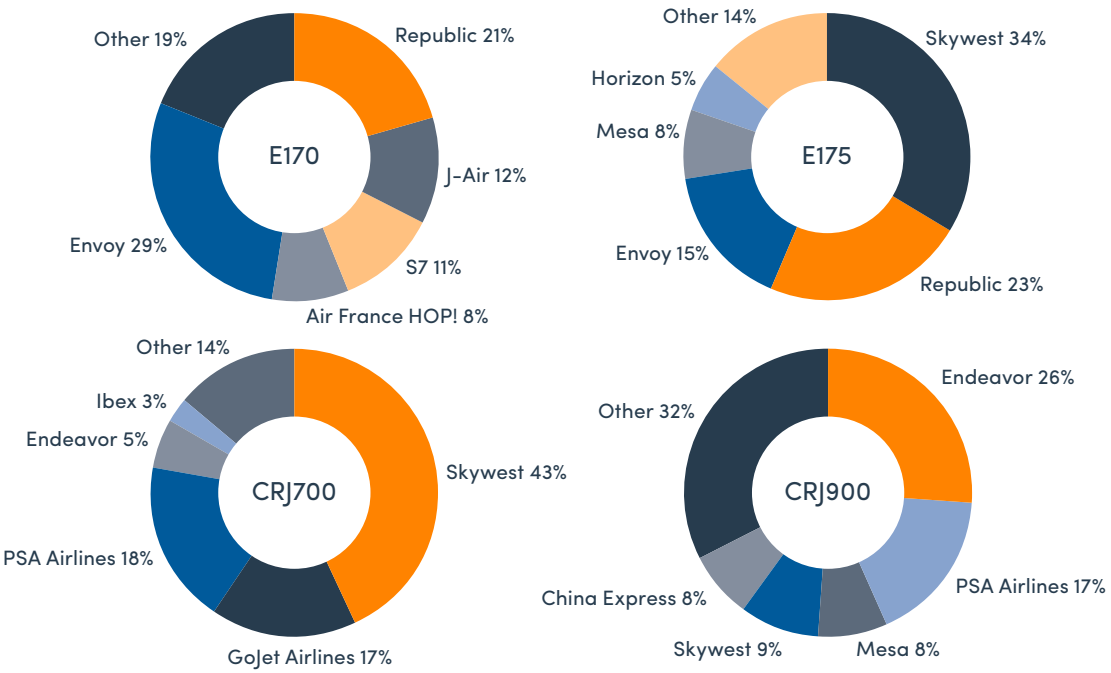
Source: Ascend by Cirium & IBA Insight

3.7 Concentration

If a large portion of any fleet is concentrated in the hands of a small number of operators, this does not assist market liquidity.

The 70-seat CRJ700/900 and the E170/175 fleet is relatively concentrated due to the dominance of US regional carriers in the space as shown in Figure 3.10. The exception to some extent is the E170, but the expectation is that many of these aircraft will also be absorbed by US carriers as second or subsequent operators. However, North American regional carriers typically keep their aircraft for the majority of their economic lives so that the risk of dumping large fleets on the used market is limited.

Figure 3.10: Largest Operators of 70-Seat Regional Jets Jan 2025



Source: Cirium

3.8 Operator Quality

There are too many airlines with 70-seat Regional Jets to comment meaningfully on the credit quality of individual operators. However, key data and trends provide indicators of future risk levels. A succinct and valuable analysis of the important factors can also be seen in a recent report by Visual Approach Analytics in collaboration with Falko (The Hidden Value of 'Regional' Aviation, Courtney Millar, Jan 2025). That report covers the whole Regional Aviation segment but in the 70-seat part the CPA portion covers 81% (Fig 3.3) of aircraft as opposed to the 54% cited by Millar for all categories of regional aircraft. If the cohort of large airline subsidiaries is included, the combined CPA and large network airlines portion increases to 90% of the global 70-seat Regional Jet fleet.

Key operator risk points include:

- North American carriers that fly 81% of 70-seat Regional Jets (see Fig 3.8) mostly operate on behalf of major airlines under CPAs. As described in section 3.1.2. the CPA model leaves market risk with the major airline partner so the regional partner is largely insulated from demand-related dynamics. This creates revenue streams that are inherently more stable than any other type of airline. This applies equally to wholly owned subsidiaries.
- All CPA providers apart from Jazz for Air Canada operate almost exclusively within the U.S. This means that revenues and costs are US dollar denominated. Therefore, foreign currency related risk is absent compared to any airline with significant international networks.
- Furthermore, in times of reduced demand such as the COVID-19 pandemic or the 2008 financial crisis, regional jets of all sizes, including 70 seaters, often temporarily replaced narrowbody aircraft to maintain service frequency and protect airport slots thereby further insulating regional carriers from market risk.
- In many cases the major partner airlines own the aircraft, which are dry leased to the CPA providers who in turn wet lease them back to the majors. This means the counterparty risk lies primarily with the fortunes of the major airlines.
- Many of the North American CPA providers are wholly-owned subsidiaries. Envoy and PSA are owned by American. Endeavor is owned by Delta and Horizon is owned by Alaska Airlines Group. Therefore, counterparty risk lies with the relevant major.
- SkyWest, the largest CPA with nearly 500 aircraft serving 251 destinations, is independently owned but is well diversified by flying for all the US majors. Republic is also independent, but majority-owned by American, Delta and United. Jazz is also independently-owned by Chorus Aviation and provides capacity to Air Canada.
- In Europe, the second largest regional jet market, the aircraft remain primarily operated as network feeders by the subsidiaries of flag carriers. Their fortunes therefore primarily rely on the associated flag carriers. However, note that although these subsidiaries are wholly owned, the parent owners do not always guarantee their subsidiary's obligations.
- The tail of independent, special missions and ACMI operators' aircraft comprise a large number of small operators that represent a wide spread of counterparty risk from both a financial and jurisdictional perspective. Based on their market position, base locations and financial results, some, including operators like Fuji Dream in Japan and Airlink in South Africa, would be considered strong to medium risk, but others would be higher risk propositions.



TrueNoord Fleet
2 CRJ900

4 70-Seat Regional Jets Owned By Lessors

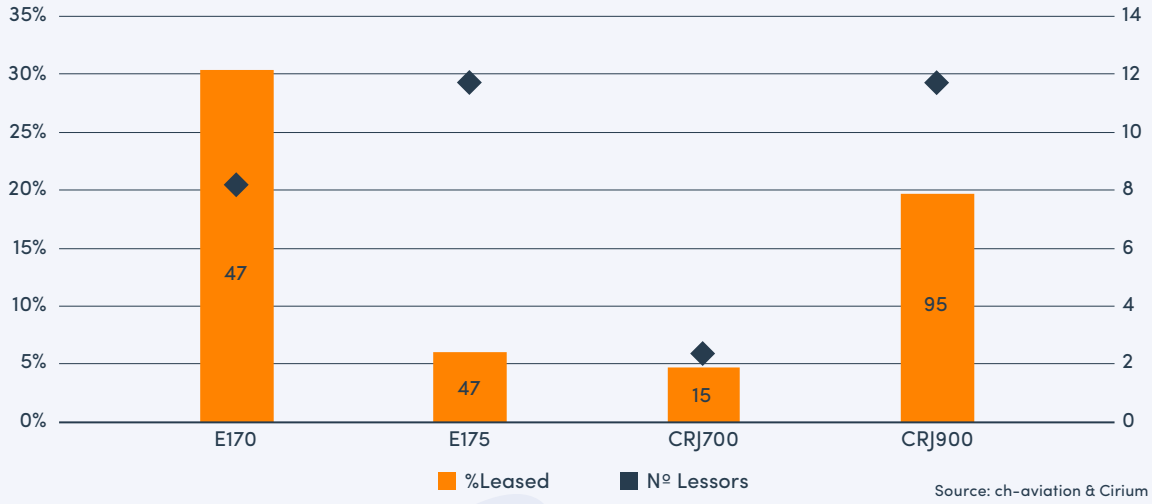
4.1 Proportion of leased 70-seat Regional Jets

The number of aircraft as a proportion of the total fleet is a strong indicator of the maturity of any type among the leasing community. Normally, a strong level of lessor penetration suggests that an aircraft is perceived as a strong asset class with good liquidity characteristics and high value retention. For example, it is widely known that close to 50% of the ubiquitous fleet of A320 and 737-800 aircraft are owned by lessors. However, in the key North American market for 70-seat Regional Jets the proportion of leased narrowbodies is much lower as other forms of financing are more common and widely available.

As is the case for all classes of aircraft in North America, the majority of the 70-seat Regional Jet fleet is not financed by operating leases. Indeed, for the E175, the most widespread of any 70-seater, only 6% of the fleet is financed by operating lessors as shown in Figure 4.1. This has reduced further since 2022 as the majority of deliveries have been to US carriers.

Only the E170 exceeds 30% lessor penetration, which is closer to the regional aircraft average. The CRJ900 has lessor penetration in the total fleet of 20%. The reason why lease penetration of the E170 and to a lesser extent the CRJ900 is greater than the others, is that a larger proportion were originally delivered to carriers outside North America. As these aircraft were gradually phased out, some were remarketed to North American operators by lessors. Others already in North America were refinanced by lessors upon expiry of initial financing arrangements.

Figure 4.1: 70-seat Regional Jet Operating Lease Penetration Comparison by Aircraft Type (% & No. Lessors)



Source: ch-aviation & Cirium

While such a low level of lease penetration would suggest that regional jet leasing is less mature compared to other classes of aircraft, the lease penetration of other larger Embraer E190-E1 is at over 40% and more than 50% for the E195-E1 and thus not so different to larger aircraft. This would support the view that the North American market is fundamentally different.

At a global level, not only is the mainline narrowbody leasing space much larger and more competitive, but also the role played by lessor forward order books is much greater in that segment. Over the last decade and particularly since the post pandemic recovery, the demand for narrowbody aircraft has far exceeded the ability of Boeing and Airbus to supply aircraft. So, lessors have placed many speculative orders in the knowledge that they will be able to place them with airlines before they could procure aircraft directly from either OEM. This imbalance of demand and supply has, to date, been less extreme in the smaller regional jet space. This makes it easier for regional carriers to access new aircraft directly from the manufacturers, which means that the business case for placing forward orders in the regional sector is less attractive.

Notwithstanding the above, a prime driver for the relative lack of 70-seat Regional Jet leasing in North America has been the long-standing role of export credit agencies. As far back as the 1990s many 50-seater ERJs and CRJs were financed by BNDES in the case of Embraer and EDC for Bombardier. This has always proven to be a cost-effective means of finance for both manufacturers and has continued ever since. As such BNDES has provided a substantial portion of the total funding needed for many of the E175s in North America at a cost that renders other forms of aircraft finance unattractive.

Lessor penetration of the whole E-Jet fleet is at 31% and 26% for the CRJ fleet. Both are lower than for narrowbodies and lower than the proportion of larger new generation Airbus and Embraer small narrowbodies.

Age Considerations

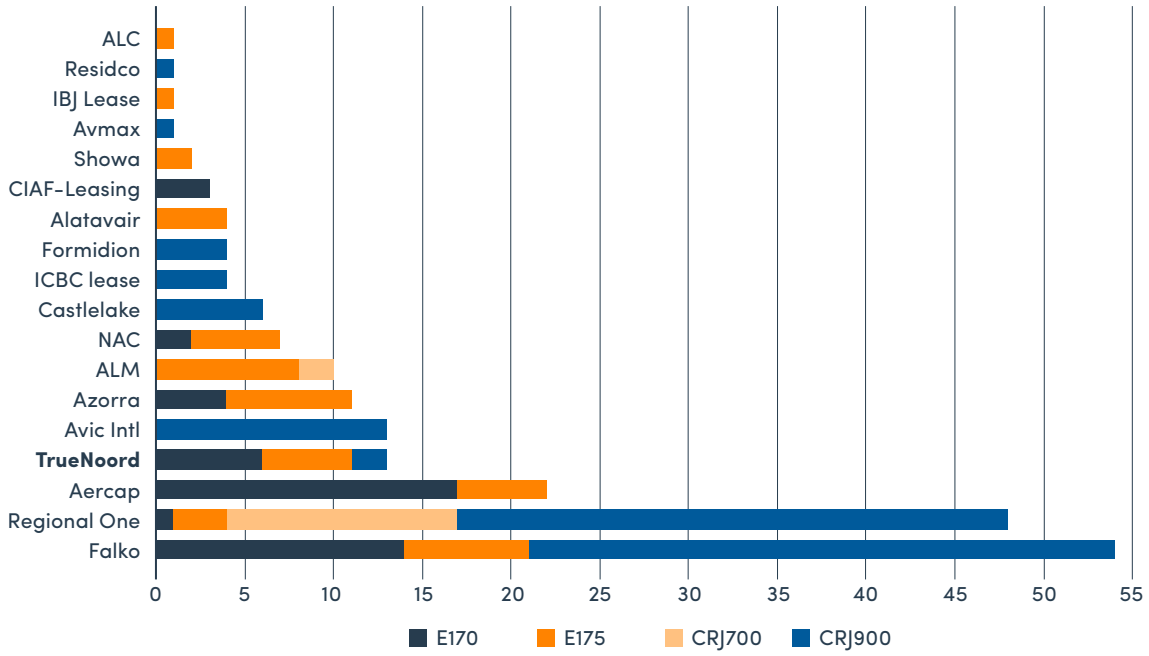
A further important aspect explaining the relative lack of leasing in North America relates to the higher-than-average age of the fleet compared to elsewhere. To a significant extent this applies to all classes of aircraft there. Although there are many lessors that focus on mid or late life aircraft, most prefer the newer aircraft space and those with older aircraft charge premium lease rates to compensate for their higher capital costs and greater counterparty risk. This has the effect of making lease economics less attractive in North America.

4.2 70-seat Regional Jet Lessors – Who's Who

Figure 4.2 shows a fleet breakdown of the lessors in the 70-seat Regional Jet space in Jan 2025. Of those with more than ten aircraft, four are exclusively active in the regional aircraft segment. The largest non-regional specialists are AerCap, AVIC and ALM. AerCap is relatively new to this regional jet segment through its recent acquisition of GECAS, although it previously already had a significant commitment to the small narrowbody market.

Amongst the purely regional aircraft lessors, Falko and Regional One are the largest lessors in this segment primarily due to their CRJ900 portfolios. The main change since 2022 relates to NAC's contraction in this segment. Previously the third largest with 44 aircraft there are now only seven remaining. Castlelake has also reduced its exposure from 20 to 6 units over the period. AerCap's position has remained stable and TrueNoord and Azorra have expanded although modestly compared to their growth in larger regional jets.

Figure 4.2: 70-seat Regional Jet Lessors – Who's Who in Jan 2025



Source: Ascend by Cirium & ch-aviation

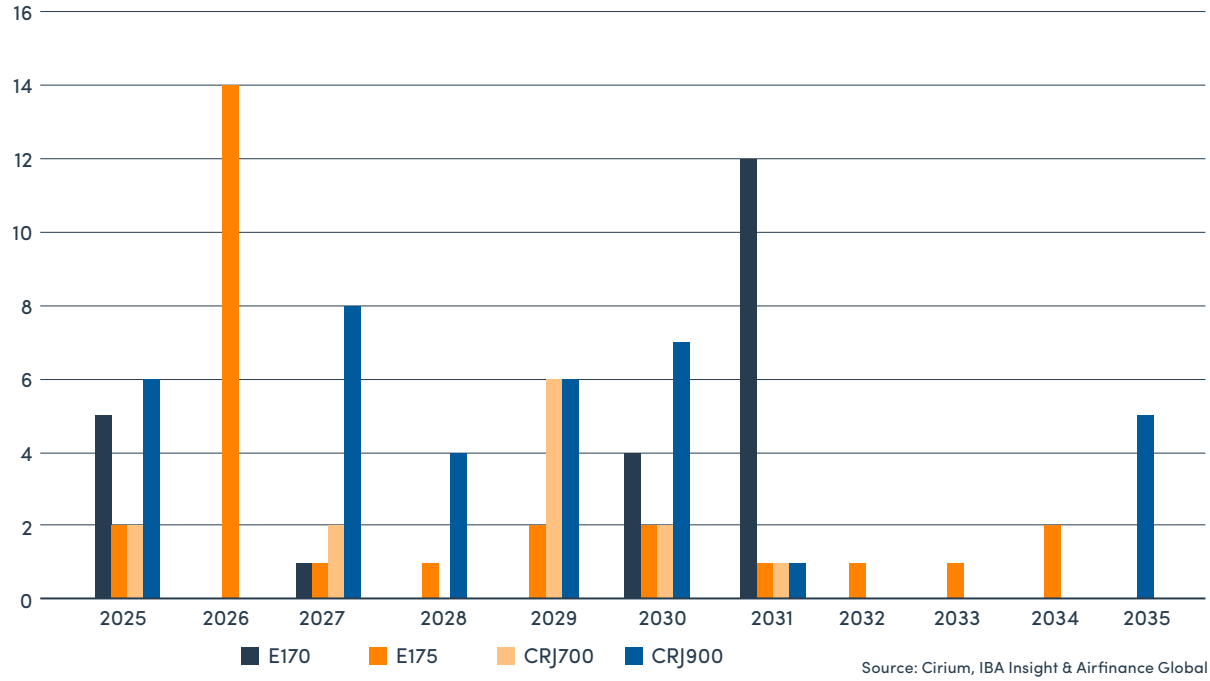
4.3 Regional Jet Leased Fleet Analysis

A significant driver of the ability to place an aircraft is the competitive position at that time. If there is a large number of any type that are scheduled to be returned in any year, it is likely to increase the competitive pressure on lease terms that can be achieved in the market at that time.

Based on the available lease return data, Figure 4.3 shows the known lease return dates from January 2025 onwards, although some of these leases are likely to be extended. Given that there is incomplete data, the number of returns in each year shown should be viewed as a minimum.

Note: While there is no accurate profile of lease return data for all leased regional jets, Cirium, InsightIQ by IBA and Airfinance Global provide partial data from those who have agreed to provide lease end data. None of these sources contain lease return data for more than about one third of leased aircraft, but combining sources leads to more complete data. For the CRJ700 70% of lease return dates are known. By contrast only about 40% of lease return dates are known for the larger CRJ900 fleet. Of the E170 fleet 48% of the lease return dates are published and 55% for the E175.

Figure 4.3: Regional Jet Known Lease Returns (Jan 2025)



Source: Cirium, IBA Insight & Airfinance Global

Lease Returns Review

Overall, the number of lease returns is relatively well dispersed over the coming decade, although there are some peak years for certain types.

CRJ Lease Returns

There are few CRJ700 lease returns over the coming years until 2029, when Gojet is scheduled to return six of its aircraft that are currently configured as CRJ550s. These could well be extended beyond that year but their age may mean that any further years of service are likely to be short lived.

Of the known lease returns for CRJ900s twelve are leased to China Express Airlines and these may not be extended, Those at U.S. carriers Endeavor, SkyWest and PSA are more likely to remain at those airlines.

E-Jet Lease Returns

As the majority of the E170/175 fleet is based in North America, its future as scope clause compliant aircraft remains relatively secure. Compared to any of the other 70-seat Regional Jets, a greater proportion of the fleet is based outside the US of which most are leased. However, this proportion has declined in recent years as those that become available have more often than not been redeployed in the US. This may continue in 2025 as four aircraft leased to LOT are due to return this year.

For the E175 fleet there are 14 lease returns shown in 2026 with very few in any other year. However, ten of these are leased to Jazz and fly for Air Canada. It is most likely that these will be extended.


TrueNoord

5 Market Availability And Demand

5.1 Demand and Supply Drivers

While the collapse in passenger traffic during the pandemic years is now largely history since most markets have recovered to 2019 levels, its other aftereffects continue to linger. The near shut-down of travel during the pandemic meant that maintenance organisations, manufacturers and their associated supply chains also curtailed their activities, and it is these parts of the aviation ecosystem that have proven much harder to restore. This means that entry-to-service for new or used aircraft in the size capacity of any aircraft including 70-seat Regional Jets has been driven more by supply constraints than by demand.

In the short and long-term the following factors are critical:

- Since post-pandemic traffic rebounded faster than anticipated in most short-haul markets in which the subject aircraft have a specific role, airlines sought to add capacity.
- During the pandemic, many mainline carriers deployed their regional jets in place of larger aircraft to maintain a reduced level of capacity during the crisis. This applied globally where significant regional jet fleets existed including Europe and North America. In the initial recovery period domestic and regional travel recovered far more quickly than cross-border flights so regional operators benefited from a faster recovery than their mainline counterparts. This meant that regional jets were initially returned to service from temporary storage relatively quickly.
- As the recovery gathered pace the focus shifted to bigger aircraft. Large network carriers that directly or indirectly control the 70-seat segment understandably prioritised larger aircraft on key routes before continuing to ramp up regional connectivity. Therefore, beyond the early recovery, regional connectivity restoration lagged behind the growth of larger aircraft services. (However, since at least a portion of air connectivity typically served by 70-seat and below aircraft is considered essential and sometimes government supported, many such routes were not suspended during the pandemic so that traffic did not collapse to the same extent as in larger city pair markets.)
- In all parts of the airline eco-system COVID-19 caused many crews to leave the industry so an acute shortage of pilots and cabin crews has hampered the restoration of supply. Since regional aircraft crews particularly in North America are typically employed on lower salary scales than those of larger aircraft, many regional airline staff transitioned to bigger aircraft thereby exacerbating shortages at regional airlines. Although during 2024 this was reported to have begun to ease, crew shortages are expected to increase again from 2026. The shortage of maintenance and engineering staff continues.
- Most small commercial aircraft types and all 70-seat Regional Jets have higher operating costs per seat than larger aircraft. With higher fuel and maintenance costs this difference becomes larger in absolute terms so that some routes previously operated by 70-seat jets have become less viable. Nevertheless, this consequence has been less pronounced than it could have been, so much so that some carriers mainly in North America have continued to keep a larger number of the even smaller 50-seat jets in service than expected.
- Although there have been some new significant E175 orders over the last two years, a combination of geo-political uncertainty and a higher inflationary environment are hampering airlines from making long-term fleet replacement and growth decisions – and not just in relation to regional aircraft.
- As the current generation of regional jets aircraft continue to age, it is normal for top tier carriers to seek to roll over their fleets into newer generation equipment. This would usually have the effect of increasing the supply of used aircraft for other second tier operators. But since the 70-seat Regional Jet fleet is so concentrated in North America where regional operators tend to commit to aircraft for a longer period than elsewhere, there have been far fewer transitions than for larger regional jets or turboprops.

Traditionally, a useful measure of used aircraft supply was the number of aircraft in storage in the short-term, and the number of projected returns in future. Stored aircraft are reviewed in Figure 5.2 and projected returns are discussed in Figure 4.3. However, as evident in Figure 5.2, a stored aircraft metric is currently not a good proxy for aircraft available since it is difficult to distinguish between aircraft that continue to be temporarily stored, those needing major maintenance inputs, and those available for sale or lease.

For most types, demand for used aircraft comes either from existing operators, which have made the conscious decision to remain with a particular type or from secondary carriers. In this respect section Figure 5.3 reviews where many used aircraft have been placed in recent years.

The after-market for used aircraft is critical for current owners. In this respect, Embraer in particular has demonstrated reasonable success in developing new markets for used E-Jets.

5.2 70-seat Regional Jet Availability – Aircraft in Storage

There is no complete inventory of aircraft available for sale or lease at any point in time. However, stored aircraft data is often used as a proxy. The weakness of this proxy is that it includes aircraft that are in transition between lessees or sellers and buyers, as well as those that may be temporarily stored for a variety of reasons. In all cases the COVID-19 pandemic led to very large increases in stored aircraft particularly in relation to the small E170 fleet as shown in Figure 5.1. In addition, the pandemic meant that a substantial proportion of stored aircraft were quickly parked for extended periods before returning to service more gradually as maintenance inputs were required. These aircraft were never available for sale or lease to others.

Nevertheless, there were significant differences in temporary storage levels of the different types and how quickly they were returned to service. In the case of the CRJ700 (Fig. 5.1(i)) pandemic related storage peaked at around 30% of the fleet but suffered a second peak in 2023. At this time some of the U.S. carriers had initiated a substantial phase-out of the type, but these have predominantly stayed in the U.S. To comply with scope clause agreements many have returned to service since 2023 as three class CRJ550s with 50 seats at GoJet for United and SkyWest for Delta.

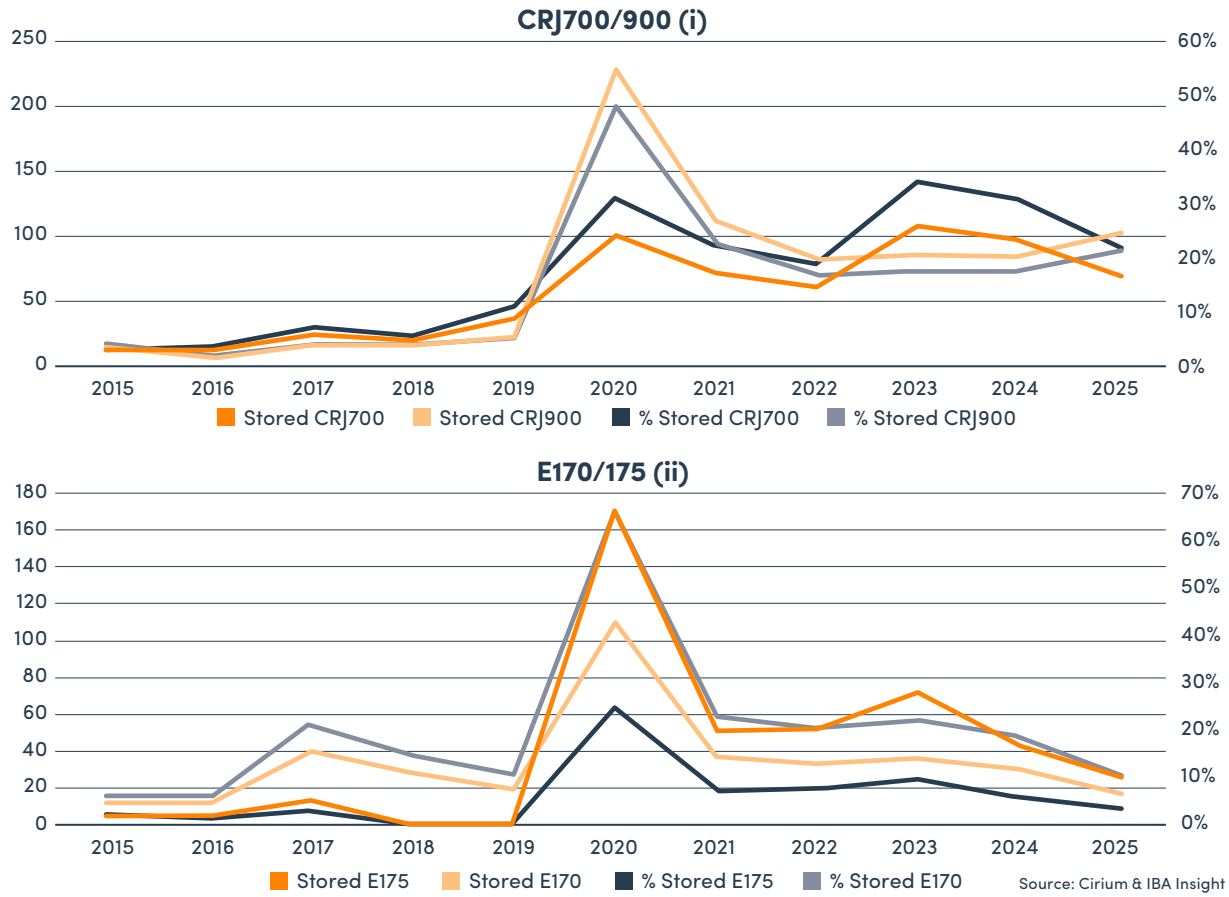
CRJ900 storage (Fig. 5.1 (i)) peaked during the 2020 lockdown, but over 50% had returned to service by late 2021 and storage levels have remained at close to 20% since that time. The majority remain with their original operators, but some continue to be retired and sold for ultimate parting out and are being replaced by E175s while others such as Endeavor continue to re-activate some aircraft.

Despite the small E170 (Fig. 5.1 (ii)) having had the distinction of the highest pandemic storage level at two thirds of the fleet, the overwhelming majority have returned to service. It is also the least concentrated in North America where 50% is based as against 81% for all 70-seat Regional Jets combined (Fig. 3.8). Storage levels have now reduced to 11% of the fleet and none are classed as stored in North America. The bulk of stored aircraft are former EgyptAir examples, which are available.

Storage levels for the E175 have always been lowest for this most popular 70-seat Regional Jet and despite its excess concentration in North America only three examples are in that region. Of those stored, four former Oman Air examples are parked and their future is unclear. The remainder are temporarily parked.

In terms of aircraft advertised for sale or lease, numbers of all 70-seat Regional Jets offered are low and continue to decline. As at April 2025, no CRJ700 or E175s were advertised as available. Six E170s at LOT and Air France HOP! are advertised and two CRJ900s.

Figure 5.1: Regional Jets in Storage Quarter 1 2025



Source: Cirium & IBA Insight

5.3 Placements of Used 70-seat Regional Jets

A useful indicator of liquidity for any aircraft type is the number of units that have transitioned from their initial operators to second or even third operators. If the traditional useful economic life of around 25 years is assumed, any aircraft would typically have a first operator that would keep it for an average of 7-10 years. The aircraft would then typically transition to a second carrier for a shorter period (5-7 years) before moving to an end-of-life third user which might comprise cargo or special mission applications.

However, in North America, where over 80% of the aircraft are deployed, most are typically operated for much longer periods and in many cases for all of their economic lives. This means that the traditional lifecycle model of aircraft usage does not apply to the subject aircraft in the same way as any other regional or indeed mainline type.

Furthermore, for the subject types, the North American market has typically absorbed mid-life and even later-life 70-seat Regional Jets that were previously elsewhere.

Longevity and absorbing units from elsewhere is particularly prevalent within the ageing CRJ fleet. While there have been relatively few transitions to new operators, a number of fleets have moved between US regional carriers while, in some cases, continuing to operate for the same major. Often this has been a consequence of carrier consolidation or changes in the terms of capacity purchase agreements for the US majors. For example, Mesa formerly operated CRJ700s for United Express but between 2021 and 2024, these were leased to GoJet who in turn agreed a new CPA contract to also operate for United Express. Conversely, some aircraft with the same regional operator have transitioned to flying for a different US major. For example, Republic has reshuffled some of its E170 fleet between its contracts for American Eagle and Delta Connection. Therefore, these are not transitions from a first operator to a secondary one in the normal meaning thereof, but more a consequence of corporate restructurings.

CRJ700/900

From a data perspective, the number of CRJ700 and CRJ900 aircraft that remain in operation and have transitioned between operators since 2015 is small.

For the CRJ700, the trend has been increasing North American concentration with 24 of 25 transitions to the region from elsewhere. Twelve former Air France HOP! (Brit Air) have transitioned to SkyWest and six former Lufthansa CityLine units are now with GoJet as CRJ550s, but these were all pre-COVID transitions.

In the CRJ900 market, North American concentration has also increased with small numbers of European aircraft from Lufthansa CityLine and CityJet moving to PSA for American Eagle (2022 & 2023) and to Endeavor. Within the U.S. a fleet of Mesa aircraft has also moved to PSA as the former switches to E175s.

E170/175

Although the E170 fleet is more geographically diverse than other 70-seat Regional Jets, there has also been some limited movement towards US carriers in recent years. In 2021 and 2022 four former BA CityFlyer transitioned to Envoy as did two former LOT examples. Three former Finnair units are now at North American Jets and five former Virgin Australia examples are now at Republic for Delta Connection. Within the US there has also been movement of Republic Aircraft to Envoy for American Eagle.

Other than movement between regional US operators there have been few other E175 transitions in recent years. In 2023 and 2024 eleven former Alitalia aircraft moved to Airlink, Marathon, LOT and Cronos. Two transitioned to Intel Air Shuttle in the US. Four former TRIP aircraft have been redeployed at Jazz for Air Canada.

5.4 Risk Factors

While manufacturers, existing Lessors and other owners have had some success in placing used aircraft with other carriers, significant risk factors remain. At a macro level and beyond any further pandemic-related risks these include:

- Any economic deterioration globally or within certain key regions such as North or Latin America could have a substantial negative impact on the demand for used regional jets.
- If the strong economic growth of pre-COVID-19 years returns, the trend towards up-sizing capacity to narrow body jets could continue and slow the demand for regional jets.
- If continued higher fuel prices persist, the relatively high fuel burn per seat of regional jets compared to other classes of aircraft may diminish their attractiveness and hasten retirement.

At a micro level, despite restricted supply of new generation aircraft from the manufacturers, it only requires one or two major carriers with substantial fleets to decide to dispose of their aircraft and replace them with larger aircraft. This could dump significant fleets on the market in a short period, which would increase supply, and thereby lower values and lease rates. However, since the majority of the fleet is deployed in North America where there is no short to medium term prospect of a change in scope clause regulations this risk is considered low. This view is reinforced by Embraer's recent decision to further delay the certification of the E175-E2.


DELTA

6 TrueNoord CMV And FMV Assessment

6.1 General Trends

There has always been some divergence in both base values (BV) and current market values (CMV) amongst the appraisal community, but there is a broad consensus that values are continuing to recover from the declines experienced by all commercial aircraft including the subject types during the pandemic years.

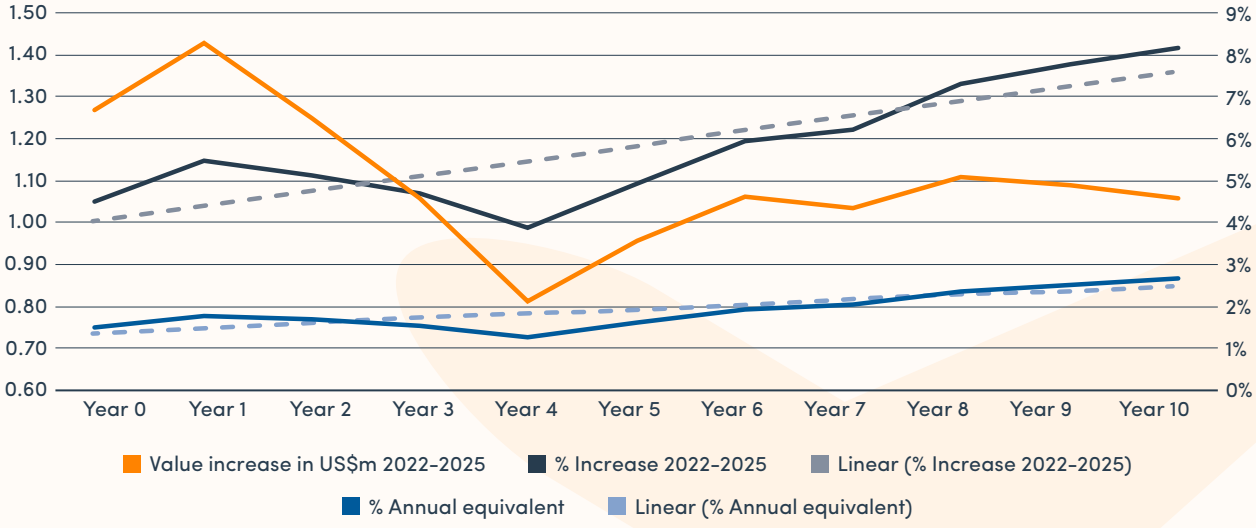
TrueNoord uses appraised values provided by Cirium, IBA, Avitas, mba and the Aircraft Value Analysis Company (AVAC). In the case of regional aircraft, IBA and mba generally have a more positive outlook while Cirium and AVAC are often more conservative, and this approach predates the pandemic.

Except for the E175, all the subject regional aircraft types are now out of production so most CMVs are applicable to used aircraft that are now at least five years old (see section 3.3). For all aircraft classes including regional jets, it is used aircraft that are generally the most impacted during a market downturn. Conversely, used aircraft can be the main beneficiary of a market recovery particularly if there is a shortage of new aircraft. Although the ongoing supply-chain-induced capacity shortage primarily impacts larger aircraft, the demand for 70-seat Regional Jets is also greater than the supply in most cases. This has led to CMV and BV recovery over recent years although not consistently across all the subject regional jets and less pronounced than for larger aircraft.

To illustrate future value recovery since 2022, Figure 6.1 below shows the percentage increase of the appraisers BV of a new E175 produced in January 2022 and January 2025, for the following 10 years – the E175 being the only 70-seat Regional Jet still currently in production. (A new aircraft increased by US$1.27m and a 10-year-old example increased by US$1.06m between 2022 and 2025). By 2025 the BV of a new aircraft had increased by 4.5% or 1.48% on a compound annualised basis over the three-year period.

While this does show post-pandemic recovery this remains below inflation in the period, which suggests that more value recovery is ahead. In relation to longer-term future values, the average view of appraisers at the 10-year point suggests improved value retention at early mid-life status. Over the three-year period from 2022 to 2025 future base values of 10-year-old examples have been increased by 8.17%.

Figure 6.1: E175 Projected 10-year Future Value Change in US$m and % between Jan 2022 and Jan 2025



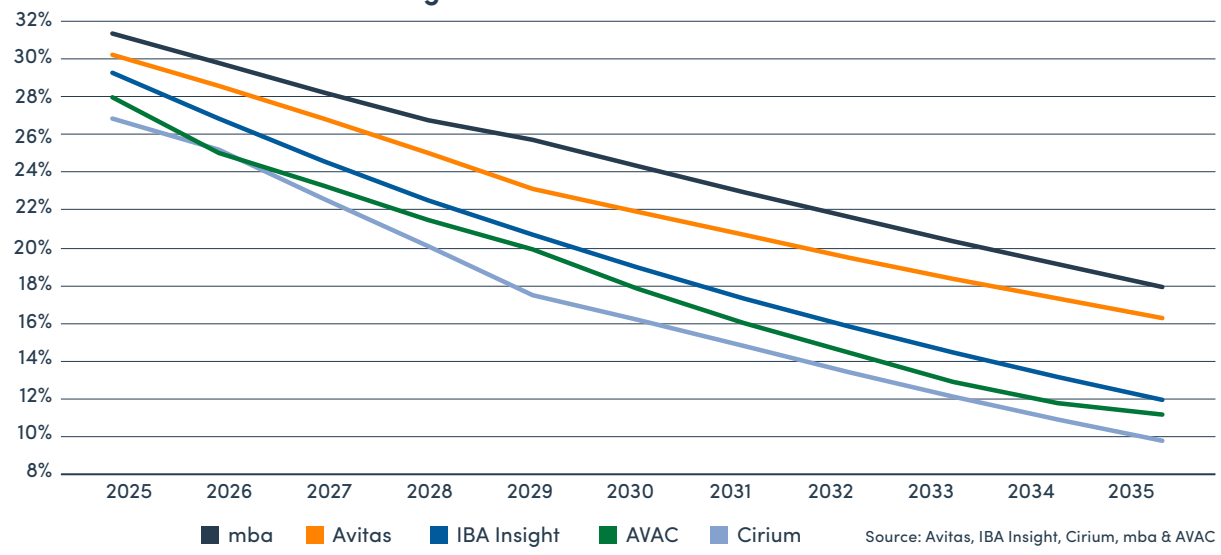
Source: Cirium, IBA Insight, mba & Avitas

6.2 New Value Trends

As the E175 is the only 70-seat Regional Jet that remains in production, its new base and future BVs are shown in Figure 6.2.

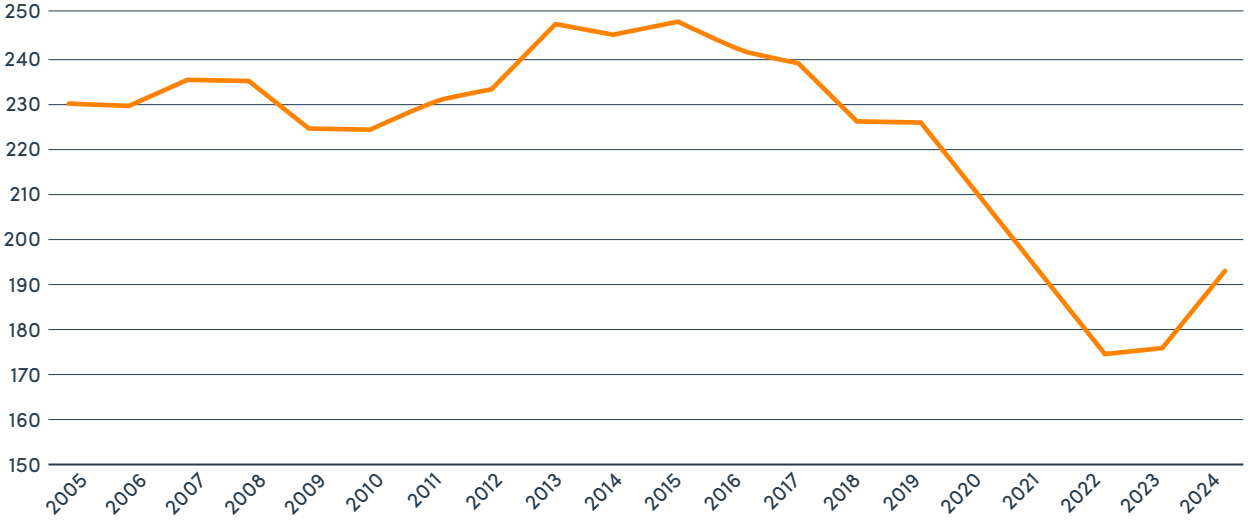
The BVs for new E175 aircraft are within quite a range exceeding US$4m with US based appraisers mba and Avitas assigning higher values than their European counterparts. Over the next ten years the future values diverge even more to a difference in excess of US$8m. The higher values ascribed by U.S. based appraisers may reflect the strength and dominance of the type in that market along with their long economic lives in that market. All the values assume a 2% rate of inflation. Although inflation has reduced over the last year or so, it remains above 2% and forecast to remain above this level and may increase so future values are likely to be higher than the average of the values shown. In addition, the new values do not fully account for OEM price escalation, which historically has been around 2% per annum, but has reached levels closer to 10% in some years since the end of the pandemic.

Figure 6.2: E175 Future Base Values



From a lease rental perspective, the appraisal community estimated that monthly rent levels for new aircraft peaked some years prior to the pandemic and fell to as low as below US$180,000 in 2022, these recovered to levels approaching US$200,000 in 2024 (fig 6.3). According to Cirium, lease rates declined from around US$240,000/mth in 2019 to US$170,000 in 2022 and have stabilised since then. At its suggested base value, this would imply a lease rate factor in the region of 0.63%. Given that funding costs have doubled to over 4% since the pandemic era the relationship between appraised market lease rates and values remains disconnected from pre-pandemic proportions. To generate similar returns to a lessor, the lease rates would need to exceed 2019 levels.

Figure 6.3: New E175 Lease Rate Constant Age in US$'000'



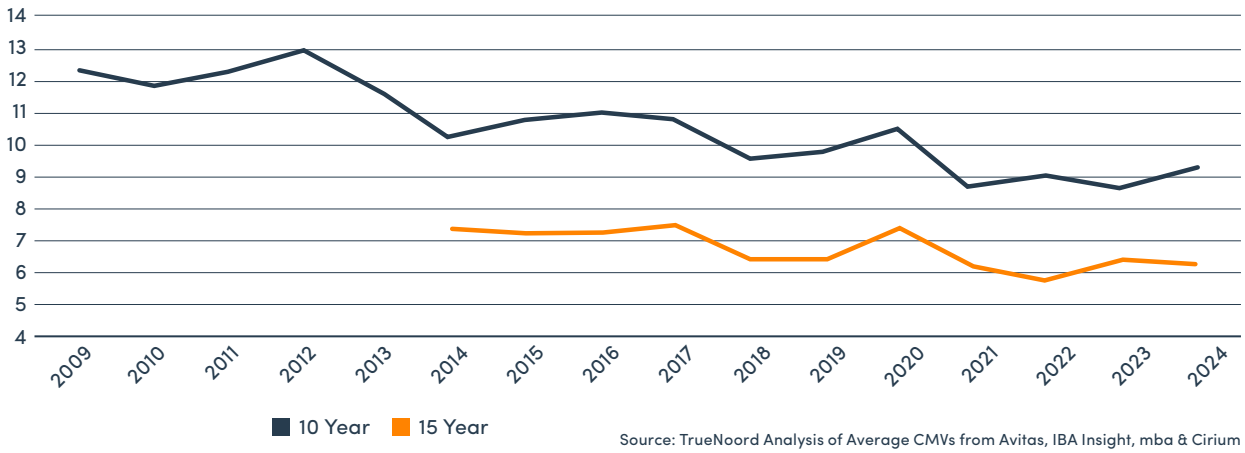
Source: TrueNoord Analysis of Average MLRs from Avitas, IBA Insight, mba & Cirium

6.3 Used Regional Jet Value & Lease Trends

6.3.1 CRJ700

TrueNoord does not own any CRJ700s and therefore has no in-house data points. However, the constant age value trajectory (Figure 6.4) shows a similar downward path to its larger CRJ900 sibling. Older mid-life 10-15-year-old examples show slowly declining values. However, as the vast majority are in North America and although some have transitioned between operators, particularly those that have been sold by Mesa for subsequent conversion to CRJ550s, will have been priced to reflect a large fleet sale. Therefore a per aircraft market value that would equate to CMV cannot be determined accurately from such transactions.

Figure 6.4: CR700 CMV in US$ million Constant Age



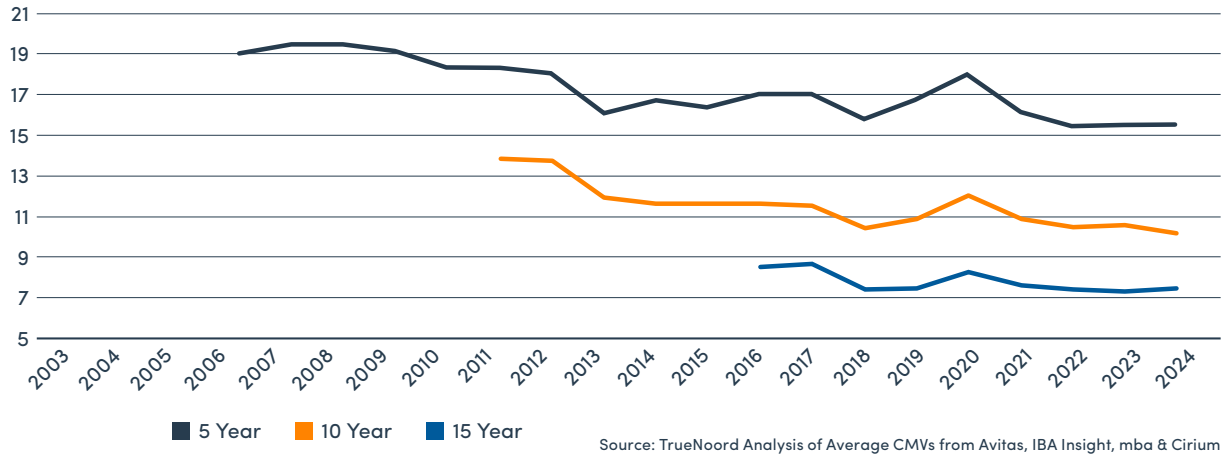
Source: TrueNoord Analysis of Average CMVs from Avitas, IBA Insight, mba & Cirium

With respect to lease rates there is a considerable divergence of opinion between appraisers with the IBA suggesting that a ten-year-old example would command a lease rate of US$102,000, while Avitas is slightly above this, but Cirium believes the current market to be below US$70,000. For older vintages Cirium suggests there is little difference as it ascribes little premium for age between ten- and 15-year-old examples. Others reduce their market rentals for older vintages so the divergence of opinion narrows for older aircraft.

6.3.2 CRJ900

Figure 6.5 below shows the CMVs in each year of values for a selection of used vintage CRJ900s. Unsurprisingly, this shows the highest new aircraft values when historical demand was the greatest, mirroring the peaks of the delivery profile shown around 2007/8. Since then, values have fluctuated within a lower US$2-3m range as demand reduced. As with all aircraft, the sharper CMV decline in 2020 reflects the impact of COVID-19. However, there were only a small number of transitions during that period so that there were very few arm's length data points. The average of appraiser values suggests stable values since then with no significant post-COVID recovery. However, this masks differences of opinion within the appraisal community. In its latest Asset Market Commentary for the CRJ900, Cirium confirms that its CMVs that had been reduced by 18% earlier in 2024 remained valid while others pointed to a more mixed picture. The IBA points to an uplift based not on demand for the type, but because of stronger values of the CF34-8C engine.

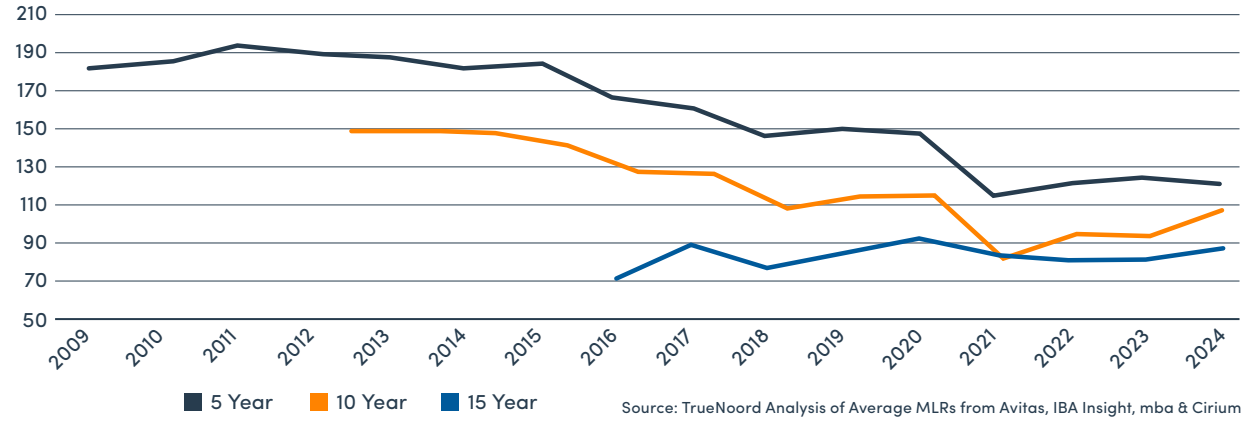
Figure 6.5: CRJ900 CMV in US$ million Constant Age



Source: TrueNoord Analysis of Average CMVs from Avitas, IBA Insight, mba & Cirium

From a leasing perspective, there is a significant divergence of opinion between appraisers on the level of lease rate recovery after the pandemic. Figure 6.6 shows some recovery for older vintages, but since this is an averaged view, it does not show differences between them. The US based appraisers show recovery while European counterparts do not. This means that for a 10-year-old example the opinions vary between US$80,000 to over US$140,000.

Figure 6.6: CRJ900 Market Lease Rates Constant Age in US$'000'

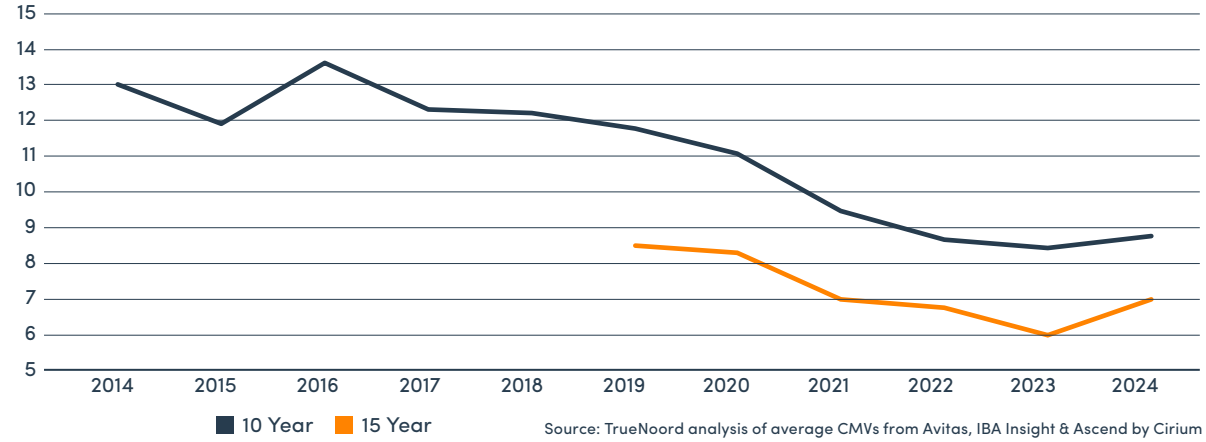


Source: TrueNoord Analysis of Average MLRs from Avitas, IBA Insight, mba & Cirium

6.3.3 E170

Figure 6.7 shows the appraised values of used E170s on a constant age basis. Since production of this model ceased in 2018 with none produced in 2017 and 2016, the newest constant age models are now approaching ten years old. The appraisal community believes that all vintages have begun to recover over the last year with the youngest 10-year-old vintage model at around US$9 million although there is some divergence of around US$2m between valuations by different firms. The improvement may reflect reduced storage levels to half of those in 2022.

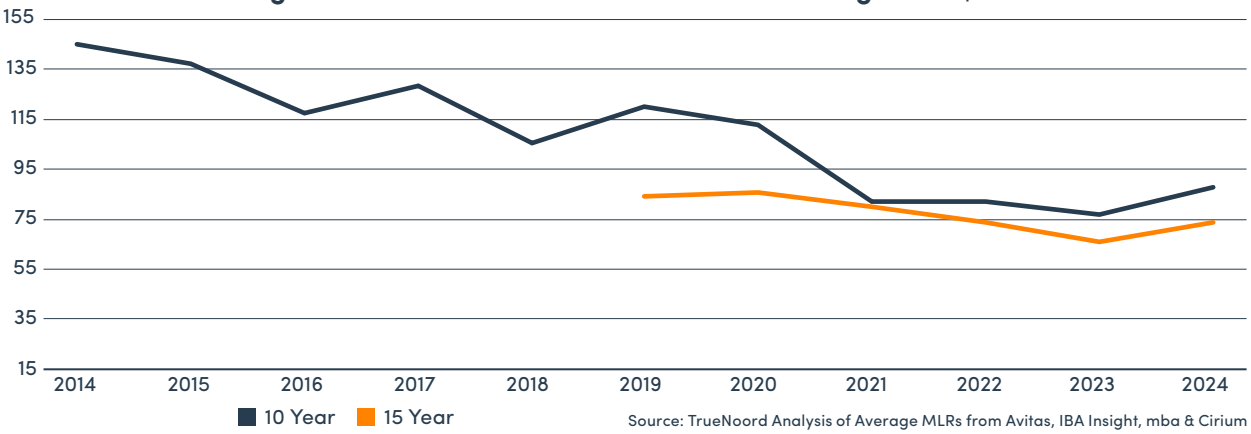
Figure 6.7: E170 CMV in US$ million Constant Age



Source: TrueNoord analysis of average CMVs from Avitas, IBA Insight & Ascend by Cirium

In relation to leases (Figure 6.8), there are few data points, but appraisers suggest that rentals for older vintages have now risen from around US$80,000 at the peak of the pandemic to amounts that marginally exceed US$100,000 for some although others show market lease rates below U$90,000.

Figure 6.8: E170 Market Lease Rates Constant Age in US$'000'

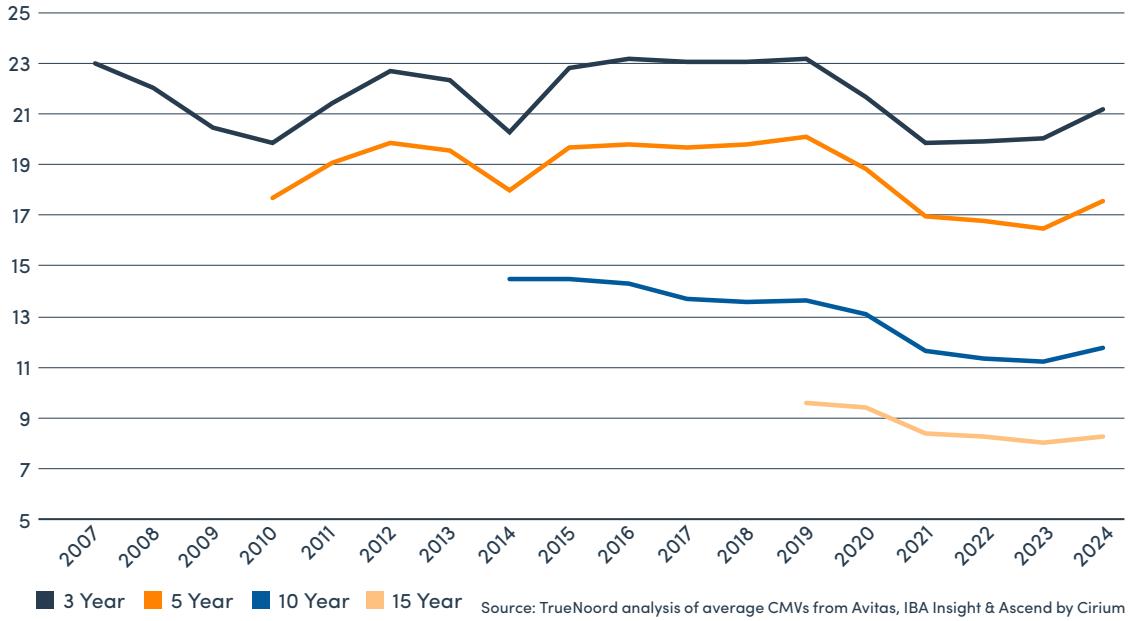


Source: TrueNoord Analysis of Average MLRs from Avitas, IBA Insight, mba & Cirium

6.3.4 E175

Along with all other regional jets, the used CMVs for E175s fell during the pandemic as shown in Figure 6.9. However, apart from during the actual lockdown period the E175 suffered less than many others partly because temporary storage periods were shorter, and the US fleet was reactivated quickly compared to other aircraft classes. By 2022 there were less than 30 aircraft in long-term storage. Values therefore stabilised as it continued to be the favoured type for US regionals. There have been few used market placements, not through lack of demand, but more likely because of constrained supply. This means that appraisers have begun to re-adjust their CMVs upwards in 2022/3 for used aircraft of all vintages.

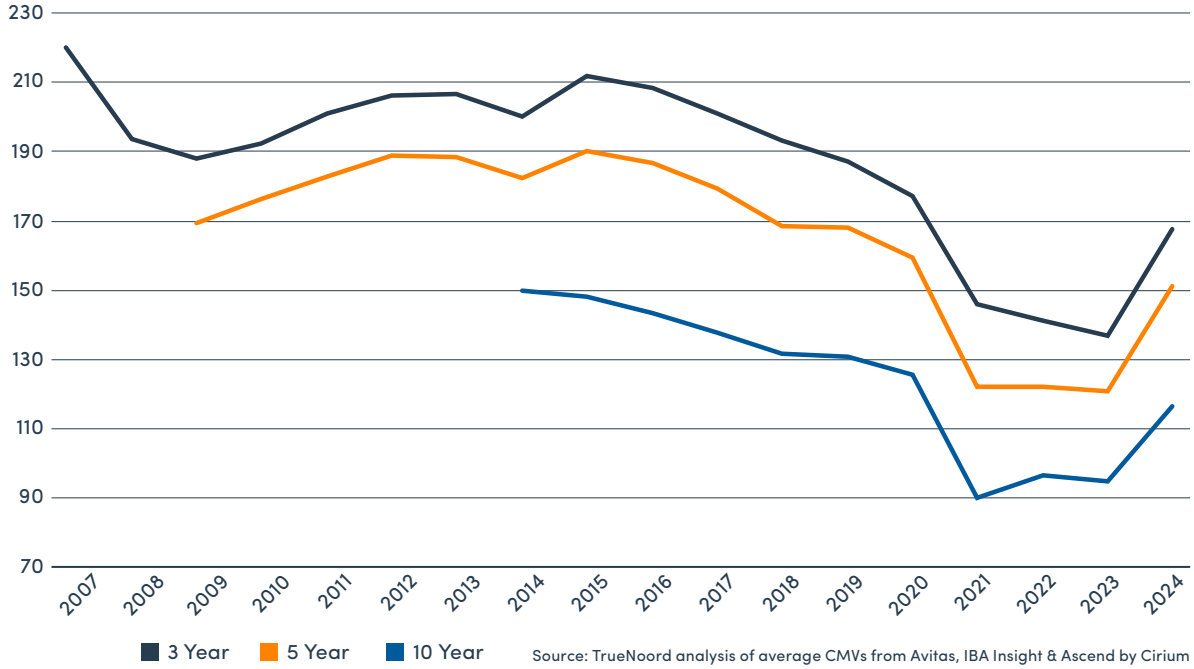
Figure 6.9: E175 CMV in US$ million Constant Age



Source: TrueNoord analysis of average CMVs from Avitas, IBA Insight & Ascend by Cirium

Given the overwhelming popularity and associated demand for the E175 it is not surprising that lease rates for used examples have recovered more than any other 70-seat Regional Jets during 2023 and 2024 (Fig 6.10). The uplift is across all vintages with the IBA's view that a 10-year-old example now commands a lease rate of US$120,000 also representing the average of the other appraisers.

Figure 6.10: E170 Market Lease Rates Constant Age in US$'000'



Source: TrueNoord analysis of average CMVs from Avitas, IBA Insight & Ascend by Cirium



Angus von Schoenberg

Industry Officer, TrueNoord

Angus is an Economics & Business graduate of Trinity College, Dublin and an Air Transport Management postgraduate of Cranfield University.

As Industry Officer for TrueNoord, he deploys his extensive experience in the regional aircraft market to develop its investment process as it seeks to both manage and expand its existing fleet of aircraft with appropriate leasing solutions for the regional market.



TrueNoord

info@truenoord.com truenoord.com

AMSTERDAM | DUBLIN | LONDON | SINGAPORE