

GLOBAL FLEET & MRO MARKET ECONOMIC ASSESSMENT 2019–2029

PREPARED BY:



Air Transport Fleet & MRO

Fleet Size.....	27,492
2019–2029 Fleet Growth Rate.....	3.6%
MRO Market Size.....	\$81.9 B
2019–2029 MRO Growth Rate	3.5%

Business Aviation Fleet & MRO

Fleet Size.....	32,583
MRO Market Size.....	\$12.7 B

Global Civil MRO Employment

Firms.....	4,918
Small/Medium Enterprises (SME).....	80.5%
Maintenance Employees.....	399,683

US Civil MRO Employment

Firms.....	4,021
Small/Medium Enterprises (SME).....	84.8%
Maintenance Employees.....	188,740

US Economic Activity

Maintenance, Repair, and Overhaul.....	\$25.5 B
Parts Manufacturing/Distribution.....	\$24.9 B
Total Economic Activity.....	\$50.4 B



FOREWORD

The analysis in this report is provided by Oliver Wyman for ARSA and its membership.

Oliver Wyman's *Global Fleet & MRO Market Forecast Commentary 2019–2029* marks our firm's 19th assessment of the 10-year outlook for the commercial airline transport fleet and the associated maintenance, repair, and overhaul (MRO) market. We're proud to say that the annually produced research, along with our *Airline Economic Analysis (AEA)*, has become a staple resource of aviation executives—whether in companies that build aircraft, fly them, or service them, as well as for those with financial interests in the sector through private equity firms and investment banks.

This research focuses on airline fleet growth and related trends affecting aftermarket demand, maintenance costs, technology, and labor supply. The outlook reveals significant changes that are important to understand when making business decisions and developing long-term plans.

As you will see from the report, the next decade holds great opportunities and challenges for the industry as both technological innovation and the move away from traditional energy sources redefine business as usual across industries and the globe. This will be an era of disruptive growth, driving companies to ask tough, fundamental questions about what it will take to stay relevant and expand.

In conjunction with the *Global Fleet & MRO Market Forecast 2019–2029*, we conduct an annual survey on hot topics, critical issues, and new opportunities in MRO. To participate in the 2019 survey, please contact the research team at MROSurvey@oliverwyman.com.

Oliver Wyman's Aviation Competitive & Market Intelligence team, partners, and vice presidents are available to assist with any questions about this forecast, as well as the AEA. We hope you find the data and insights valuable as you refine your business models and develop strategies for moving forward.

Best regards and wishes for a wonderful 2019,

A handwritten signature in black ink that reads "Steve Douglas". The signature is written in a cursive, flowing style.

Steve Douglas
Vice President

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An aerial night photograph of a city, showing a dense network of streets and buildings illuminated by warm yellow and orange lights. The city lights create a complex, glowing pattern against the dark night sky. In the foreground, a large, dark, circular lens or camera element is visible, partially obscuring the view of the city. The lens has a bright orange-red glow at its bottom edge.

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EXECUTIVE
SUMMARY

EXECUTIVE SUMMARY

The aviation industry and the businesses that support it are experiencing another year of unparalleled growth, thanks to an expansion in the global population able to afford air travel. Rising incomes and consumer spending are pushing passenger travel to record levels and fueling the largest year-over-year increase of the in-service fleet since 2008.

Looking ahead a decade, air travel demand is anticipated to be equally robust, with an additional 200 million people expected to enter the middle class across the planet. Growth in revenue passenger kilometers (RPK) will regularly exceed the annual expansion of gross domestic product (GDP) in most economies—particularly in high-growth areas like China and India. Even amid global trade tensions, the projections for commercial air travel remain optimistic across all regions of the world.

Consequently, the persistent demand is spawning record growth in the global fleet. For the beginning of 2029, our forecast projects a total fleet of 39,175 aircraft, up more than 11,600 from the 2019 total of 27,492. Between 2019 and the beginning of 2024, we anticipate the in-service fleet will grow annually at 3.9 percent—a pace that will slow to 3.3 percent for the next five years.

The order book and the corresponding delivery schedule associated with this expansion are translating into significant business for the world's leading airframe manufacturers, Boeing and Airbus. The bulk of the fleet expansion will be narrowbody jets, such as Boeing's 737 MAX and Airbus' A320neo. By 2029, nearly 13,800 737 MAX and A320neo aircraft will have been delivered, at which time narrowbodies will represent over two-thirds of the entire global fleet.

To satisfy airline needs, Boeing and Airbus plan to ramp up already historically high monthly production. Airbus has publicly committed to producing 63 A320s per month in 2019 and eventually increasing that to 75 per month sometime in the 2020s. Boeing also has announced its intention to boost production of its 737 MAX by nearly 10 percent to 57 per month in 2019 and has said it is studying ways to increase the monthly rate to between 63 and 70 in 2020.

Perhaps not surprisingly, the ramp-up has proved disruptive, particularly to the supply chain of the two original equipment manufacturers (OEMs). Late deliveries of fuselage components and engines have caused OEM production delays and, in turn, late deliveries to airlines. The unfulfilled orders have prompted carriers to defer formal retirements and even pull aircraft out of storage to keep up with the demand for air travel.

RISING COSTS AND EMISSIONS

However, there are complications from delaying the replacement of older aircraft with the new, more fuel-efficient series becoming available. By retaining older aircraft to meet capacity needs, airlines have been unable to reduce jet fuel consumption at an important time. Driven by crude oil production cuts by the Organization of Petroleum Exporting Countries (OPEC) and economic turmoil in Venezuela, jet fuel prices have been climbing since 2016. They hit a three-year high in October 2018 before falling over 25 percent during the fourth quarter. Despite this end-of-year dip, jet fuel prices have begun to make a dent in airline profitability, adding more than \$31 billion in operating costs during the year and shrinking margins by almost a full percentage point.

Decisions to keep older planes in service have also slowed airline efforts to cut greenhouse gas emissions. All airlines with international service started monitoring carbon emissions on January 1, 2019, in compliance with a landmark climate change agreement brokered by the International Civil Aviation Organization that requires reductions in airline emissions beginning in 2021. By 2029, new aircraft are expected to make up 42 percent of the fleet which, on average, will produce between 15 and 20 percent fewer emissions than their predecessors. That said, high travel demand will complicate the ability of the aviation industry to meet emission targets.

Labor costs also have been on the rise as contracts are negotiated in an environment of strong profitability and a tight labor market. Upward pressure on wages is expected to escalate as the gap grows between the number of pilots and trained aviation maintenance technicians available and the number needed. Labor and fuel are the industry's two largest operating expenses, representing almost half of total operating costs.

Boeing projects that the aviation industry will need 635,000 new commercial pilots by 2037 to satisfy growing demand within the sector. Currently, there are roughly 550,000 full-time commercial pilots, but because of the heavy contingent of baby boomers (born between 1946 and 1964) among them, a significant percentage are expected to retire within the next 10 years.

A similar situation affects aviation maintenance technicians (AMTs) who, like pilots, are on average older than workers in other industries, such as technology, retail, and healthcare. The challenge of being a mechanic in today's environment also is more difficult, requiring the ability to service older aircraft built before 2000 as well as newer planes with more sophisticated technology.

Combined, these increased operating expenses are already putting pressure on what has been an unprecedented period of airline profitability. Since 2011, US airline profits have increased with each successive year. That turns out not to be the case in 2018, when cumulative net profits for North American carriers are expected to slip to \$14.7 billion versus the \$18.7 billion earned in 2017—a drop of more than 20 percent.

Additionally, the International Monetary Fund (IMF) indicated in its October 2018 outlook that growth in the largest global economies may have peaked, even as the world GDP growth rate is expected to remain at 3.7 percent for 2019. The agency described the global economy as “fragile,” with increased risk and declining odds for upside surprises. The United States and the European Union will both expand at below three percent this year and at less than two percent in 2020, according to the IMF. China, while still growing at more than six percent, will also see economic growth slow over the next two years.

Weakening Western European economies and the rising prospect of no Brexit deal by the March 29, 2019, deadline may cause problems for the region's aviation industry. While the United Kingdom has pledged to recognize certificates, approvals, and licenses issued by the European Aviation Safety Agency (EASA) for at least two years whether a deal is in place or not, the EU has publicly stated it would not recognize UK certificates, approvals and licenses in the same way. This could cause a substantial disruption in air travel in and out of the UK.

Meanwhile, European airlines are likely to consolidate, with several smaller European carriers going out of business this year and several more teetering. While disruptive, the closures and the consolidation that will inevitably follow should be positive for carriers, as it was for the US industry a decade ago.

MORE CARGO AND MRO

Like passenger air travel, cargo volume also has been growing, driven primarily by the double-digit expansion of e-commerce sales in recent years. Air cargo demand as measured by freight tonne kilometers (FTK) saw an estimated 3.8 percent increase in 2018, while cargo capacity, measured by available freight tonne kilometers, saw an estimated 4.4 percent increase, after a slight contraction in 2017 (FTK measures metric tonnes of cargo per kilometer).

Yet, for incumbents, there is potential disruption ahead with the entry into the delivery space of e-commerce giant Amazon. The internet retailer is building a \$1.5 billion international air cargo hub in Cincinnati, Ohio. The 1,100-acre complex is anticipated to eventually support a fleet of more than 100 Amazon Air Cargo aircraft; the company has already acquired 40.

Besides air delivery by jets, Amazon is also testing a drone delivery service. Much of the drone testing by Amazon and other tech companies has occurred outside the US because of strict federal and state aviation rules that limit drone use. Google, for instance, recently started a pilot drone delivery service in Finland. Within the decade, we expect to see commercial drone delivery develop, although it may not be initially in the US.

With the expansion of business in the commercial aviation industry, the maintenance, repair, and overhaul (MRO) market that supports it is also expected to grow. Total MRO spend is expected to rise to \$116 billion by 2029, up from \$81.9 billion in 2019. Aside from the growth in the fleet, the increase will be driven by more expensive maintenance visits and technology enhancements.

The annual average growth rate for the MRO market will be 3.5 percent over the decade. More of this growth will take place between 2024 and 2029, when MRO spend will grow \$19 billion versus \$15 billion between 2019 and the start of 2024. The slower initial five years will be driven by the escalating number of newer-generation aircraft that enter the fleet. These aircraft have longer maintenance intervals and replacement thresholds for such things as life-limited parts than older jets.

Growth in aviation will be more concentrated in Asia and the developing world, particularly China and India. By 2035, the Civil Aviation Administration of China projects, the number of airports in the nation will almost double, reflecting this spike in demand and the government's big push to fund the necessary infrastructure. By the end of the decade, China will become the biggest global market for air travel and Asia will be the new center of global aviation activity.

FLEET AND MRO FORECAST SUMMARY

REGION	AFRICA	MIDDLE EAST	ASIA PACIFIC	CHINA	INDIA	LATIN AMERICA	NORTH AMERICA	EASTERN EUROPE	WESTERN EUROPE	WORLD
2019 FLEET										
NARROWBODY	460	564	2,152	2,819	460	1,085	4,208	896	3,294	15,938
WIDEBODY	179	781	1,383	414	67	177	1,277	153	1,057	5,488
REGIONAL JET	159	66	220	143	4	273	1,905	241	466	3,477
TURBOPROP	327	29	655	-	73	236	643	124	502	2,589
TOTAL	1,125	1,440	4,410	3,376	604	1,771	8,033	1,414	5,319	27,492
2029 FLEET										
NARROWBODY	749	906	3,803	6,146	1,177	1,582	5,493	1,169	4,752	25,777
WIDEBODY	340	1,278	1,817	780	149	364	1,694	240	1,383	8,045
REGIONAL JET	73	47	415	261	13	277	1,624	252	365	3,327
TURBOPROP	163	46	594	22	208	164	436	82	311	2,026
TOTAL	1,325	2,277	6,629	7,209	1,547	2,387	9,247	1,743	6,811	39,175
FLEET GROWTH RATES										
2019–2024	1.5%	5.0%	4.9%	9.6%	12.1%	2.7%	1.3%	2.6%	2.7%	3.9%
2024–2029	1.8%	4.4%	3.4%	6.2%	7.7%	3.4%	1.6%	1.7%	2.3%	3.3%
2019–2029	1.6%	4.7%	4.2%	7.9%	9.9%	3.0%	1.4%	2.1%	2.5%	3.6%
2019 MRO (US\$ BILLIONS)										
AIRFRAME	\$0.9	\$1.5	\$3.7	\$2.2	\$0.7	\$1.1	\$5.2	\$1.3	\$4.6	\$21.1
ENGINE	\$0.9	\$5.6	\$7.1	\$2.2	\$0.7	\$1.5	\$7.8	\$1.6	\$6.0	\$33.4
COMPONENT	\$0.4	\$0.9	\$2.2	\$1.3	\$0.3	\$0.8	\$4.1	\$0.7	\$2.9	\$13.8
LINE	\$0.3	\$1.0	\$2.3	\$1.5	\$0.3	\$0.7	\$3.4	\$0.7	\$3.4	\$13.7
TOTAL	\$2.6	\$9.0	\$15.3	\$7.2	\$2.0	\$4.1	\$20.5	\$4.3	\$16.9	\$81.9
2029 MRO (US\$ BILLIONS)										
AIRFRAME	\$0.8	\$2.1	\$4.7	\$4.2	\$0.9	\$1.2	\$5.2	\$1.2	\$4.7	\$25.0
ENGINE	\$1.3	\$8.0	\$8.5	\$7.3	\$1.6	\$2.3	\$10.3	\$2.0	\$8.7	\$50.0
COMPONENT	\$0.7	\$1.5	\$3.6	\$3.6	\$0.9	\$1.2	\$4.7	\$1.1	\$3.7	\$21.0
LINE	\$0.5	\$1.5	\$3.4	\$3.3	\$0.7	\$1.0	\$4.2	\$0.9	\$4.4	\$20.0
TOTAL	\$3.4	\$13.1	\$20.3	\$18.3	\$4.0	\$5.6	\$24.5	\$5.2	\$21.5	\$116.0
MRO GROWTH RATES										
2019–2024	1.4%	3.8%	3.6%	11.0%	6.0%	3.1%	1.1%	2.1%	2.4%	3.4%
2024–2029	4.1%	3.9%	2.1%	8.5%	8.2%	3.3%	2.5%	1.9%	2.5%	3.7%
2019–2029	2.7%	3.9%	2.9%	9.7%	7.1%	3.2%	1.8%	2.0%	2.5%	3.5%