

GLOBAL FLEET & MRO MARKET ECONOMIC ASSESSMENT 2017-2027

PREPARED BY:

 OLIVER WYMAN

Air Transport Fleet & MRO

Fleet Size.....	25,368
2017-2027 Fleet Growth Rate	3.4%
MRO Market Size	\$75.6 BN
2017-2027 MRO Market Growth Rate	3.8%

Business Aviation Fleet & MRO

Fleet Size.....	31,036
MRO Market Size	\$10.9 BN

Global Civil Maintenance Industry Employment

Firms.....	4,848
Small/Medium Enterprises (SME).....	80.7%
Employees.....	372,287

U.S. Civil Maintenance Industry Employment

Firms.....	4,012
Small/Medium Enterprises (SME).....	84.9%
Employees.....	186,410

U.S. Civil Maintenance Industry Economic Activity

Maintenance, Repair, and Overhaul	\$21.3 BN
Parts Manufacturing/Distribution.....	\$22.8 BN
Total Economic Activity.....	\$44.1 BN




AIRSA



The analysis in this report is provided by Oliver Wyman/CAVOK for the Aeronautical Repair Station Association (ARSA) and its membership.

ARSA is the only association devoted to the unique needs of the global civil aviation maintenance industry. It is dedicated to helping member companies operate more efficiently and effectively, while continuing to ensure the safety of aircraft worldwide. To learn more about the association's work on behalf of both industry stakeholders and the flying public, please visit [ARSA.org](https://www.arsa.org).

Seen as industry-leading research, each year the Oliver Wyman research team analyzes trends and changes in the industry to produce a 10-year forecast of the global fleet composition and corresponding MRO marketplace.

Besides Oliver Wyman's expertise in technical operations, regulatory compliance, certification, and the MRO space in general, we advise global, regional, and cargo carriers, aerospace and defense original equipment manufacturer (OEMs) and suppliers, airports, MROs and other service providers in the transport and travel sector on how to grow shareholder and stakeholder value, optimize operations, and maximize commercial and organizational effectiveness.

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EXECUTIVE SUMMARY

Oliver Wyman's 2017 assessment and 10-year outlook for the commercial airline transport fleet and the associated maintenance, repair, and overhaul (MRO) market marks the 17th year of supporting the industry with informed, validated data. This has become the most credible go-to forecast for many executives in the airline and MRO industry as well as for those with financial interests in the sector, such as private equity firms, investment banks and investment analysts.

The global airline industry has made radical changes in the last few years and is producing strong financial results. While the degree of success varies among the world regions, favorable fuel prices and widespread capacity discipline are regarded as key elements in the 2016 record high in global profitability (\$35.6 billion). For an in-depth review of airline profitability, Oliver Wyman's 2017 Airline Economic Analysis provides comprehensive analysis and insights complementing this publication.

This report focuses on the related airline fleet growth and trends, as well as the resulting impact on maintenance costs and volumes. The outlook reveals significant changes that are important to understand in making business decisions:

- New-generation aircraft (designed and built after 2000) are introducing improved operating costs and new technology that will require investment in upgrading IT infrastructure. The technology includes new construction materials (carbon fiber composites, hybrid alloys, and special coatings) as well as new data collection and measurement tools designed to provide advanced prognostication capability. Properly harnessed, the capability for maintenance organizations to take action before a component fails promises to improve reliability and reduce costs. The challenge is that there are not yet proven systems to accept and analyze the data for proactive decision-making.
- The in-service commercial airline fleet is forecast to grow from nearly 25,000 aircraft at the beginning of 2017 to over 35,000 by 2027. The rate of aircraft deliveries to airlines will total about 20,000 over the period, so retirements of older technology will accelerate to about 10,000 during that time.
- The accelerated rate of deliveries will result in a massive technology shift over the period. By 2027, 58% of the fleet will be new-generation aircraft.
- Net fleet growth by world region will be uneven, resulting in changes in regional size rankings over the period. The major growth engine will be Asia, especially China and India, which will become the largest region, nearly doubling in in-service fleet and related MRO demand. By contrast, North America will experience little absolute growth, although there will be a significant upgrading of the fleet over the period. North America will slip to the second-largest region, behind Asia.
- Fleet mix will change appreciably over the period. Narrow-body aircraft will grow faster than the other classes. The regional jets and turboprop fleets will shrink in their share of the fleet, while wide-body aircraft will hold flat. By 2027, the shifts will result in a narrow-body share of 65 percent and wide-

body share of 21 percent, while the smaller regional jet and turboprop fleets will slide 10 points to a combined 14 percent share.

- The retirement of aircraft will remain brisk. Having fallen out of favor in recent years, small regional jets and narrow-bodies have been the predominant source of aircraft retirements, resulting in a surprisingly young retirement age of about 18 years. However, with many of these smaller-capacity aircraft now purged from the fleet, the industry can expect retirement ages to climb again as retirement selections will naturally revert to older, larger-capacity aircraft.
- The significant increase in retirements will continue to fuel the growing Used Serviceable Material (USM) market. Increased USM has the potential of reducing material costs for airlines and MROs.

During this period, each of the fleet complexities translates to significant changes and challenges for the MRO sector. Commercial airline MRO growth will be healthy at 3.8% compound annual growth rate (CAGR) over the 10-year period, growing from the current demand of \$75.6 billion to just over \$109 billion by 2027.

Similar to fleet growth, Asia will experience the bulk of the increase and will be challenged to build the infrastructure and new facilities as well as train a workforce to keep up with the rapidly rising demand. At the same time, the North American MRO industry will plateau as its growth comes from stealing share or attracting business from other regions.

The up-gauging of aircraft, coupled with the fast growth of new-generation aircraft, presents some very real challenges for the MRO industry worldwide.

In the MRO space, the original equipment manufacturers (OEMs) will increase their share of the aftermarket with shrewd strategies that have proved successful to date. The shift will definitely squeeze the independent MRO sector, particularly the smaller businesses.

The commentary provided in this report will cover the details associated with these market changes. This assessment has been developed to assist operators and the financial sector with a clear outlook for the industry. This will be an era of disruptive growth, driving companies to carefully develop strategies to maintain relevance and expand.

Oliver Wyman's Aviation Competitive & Market Intelligence team, partners, and vice presidents are available to assist with any questions related to this forecast.

Region	Africa	Middle East	Asia Pacific	China	India	Latin America	North America	Eastern Europe	Western Europe	World
2017 Fleet										
Narrow-body	447	516	1,981	2,316	346	1,066	3,917	716	3,027	14,332
Wide-body	167	709	1,304	328	52	157	1,188	117	978	5,000
Regional jet	143	74	213	111	5	292	1,855	180	492	3,365
Turboprop	294	23	648	0	46	263	714	131	552	2,671
Total	1,051	1,322	4,146	2,755	449	1,778	7,674	1,144	5,049	25,368
2027 Fleet										
Narrow-body	618	841	3,546	5,452	831	1,571	4,960	890	4,419	23,128
Wide-body	277	1,325	1,772	705	102	343	1,434	121	1,342	7,421
Regional Jet	45	28	237	315	60	200	1,444	74	364	2,767
Turboprop	164	69	730	23	73	182	457	47	447	2,192
Total	1,104	2,263	6,285	6,495	1,066	2,296	8,295	1,132	6,572	35,508
Fleet Growth Rates										
2017-2022	0.5%	6.6%	5.2%	10.6%	11.9%	2.8%	0.9%	-0.8%	3.2%	3.9%
2022-2027	0.5%	4.5%	3.4%	7.3%	6.2%	2.4%	0.7%	0.60%	2.2%	3.0%
2017-2027	0.5%	5.5%	4.2%	9.0%	9.0%	2.6%	0.8%	-0.1%	2.7%	3.4%
2017 MRO (US\$ BN)										
Airframe	0.6	1.2	3.0	1.5	0.3	0.8	4.5	0.7	5.0	17.7
Engine	1.6	21.0	4.9	3.4	11.0	2.2	6.2	1.5	5.9	29.6
Component	0.5	1.1	2.9	1.2	0.3	0.8	4.7	0.7	3.3	15.5
Line	0.3	0.9	2.2	1.3	0.2	0.7	3.2	0.6	3.3	12.8
Total	3.0	5.9	13.0	7.5	1.9	4.5	18.7	3.6	17.5	75.6
2027 MRO (US\$ BN)										
Airframe	0.5	1.7	3.8	3.0	0.5	1.0	4.5	0.7	4.7	20.4
Engine	1.7	4.9	8.4	10.0	1.8	4.2	7.7	1.8	7.5	47.9
Component	0.6	2.3	4.7	3.6	0.7	1.2	4.9	0.8	4.2	22.9
Line	0.4	1.4	3.2	3.1	0.5	1.0	3.6	0.6	4.1	18.1
Total	3.1	10.3	20.0	19.7	3.5	7.3	20.7	3.8	20.6	109.2
MRO Growth Rates										
2017-2022	0.0%	6.4%	4.0%	9.0%	7.9%	3.4%	-0.7%	-2.7%	-0.3%	2.4%
2022-2027	1.2%	5.0%	4.7%	11.3%	5.4%	6.8%	2.8%	4.1%	3.6%	5.2%
2017-2027	0.6%	5.7%	4.4%	10.1%	6.7%	5.1%	1.0%	0.7%	1.6%	3.8%

