Scope and Methodology
Global Forecast Overview

U.S. Forecast

- Overview
- Fighters
- Trainers and Light Fighters
- Air-Refueling Tankers
- Transports
- C4ISR Aircraft
- Maritime Aircraft
- Rotary-Wing Overview
Scope

➤ All Western, piloted, military aircraft
➤ Military aircraft:
  ▪ Operated by a nation’s military services, or
  ▪ Performing an inherently military function
  ▪ Notable Exclusions: CRAF, CAP, Intelligence Organizations
➤ Piloted: Unmanned Air Vehicles (UAVs) not included
➤ Western: aircraft families originally designed outside of the following regions/countries:
  ▪ Eurasia (Russia, Ukraine, Moldova, Belarus, the Caucasus and Central Asia)
  ▪ South Asia
  ▪ Iran
  ▪ China
  ▪ North Korea
➤ Counts are in-service aircraft only
Forecast Methodology: Key Points

➤ Military Aircraft Database:
  ▪ In-service fleets + 10-yr. projections for deliveries/retirements, updated year-round.
  ▪ Demand-based, intelligence-driven, discrete approach.
  ▪ Sources: Aviation Week reporting; Reputable publications and periodicals; Government documents; Extensive primary research.

➤ MRO Cost Data:
  ▪ 20K+ datapoints, with thousands of recent actuals.
  ▪ Utilization, Field Mx salaries, Field Mx material costs and depot-level requirements for airframe, engines and 12 categories of components.

➤ MRO Algorithms, informed by trends and issues, combine with Fleet and MRO data to generate MRO Requirements.

➤ Data Cutoff: October 2015
Categorization

Region

- North America
- Latin America and Caribbean
- Europe
- Middle East
- Eurasia
- Sub-Saharan Africa
- South Asia
- Asia-Pacific

MRO Type

- Field Maintenance
- Airframe Depot Mx
- Engine Depot Mx
- Component Depot MX:
  - Mission Avionics, Cockpit Systems, Landing Gear, Wheels and Brakes, APU, Dynamic Components, Hydraulics, Pneumatics, Fuel system, Electrical System, Other
## Mission Categorization

<table>
<thead>
<tr>
<th>Mission Category</th>
<th>Mission Subcategories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bomber</td>
<td></td>
</tr>
<tr>
<td>Fighter</td>
<td>Air Superiority, Multi-role, Attack, Electronic Attack, Multi-role (ship-based), flight Demonstration, Adversary Trainer</td>
</tr>
<tr>
<td>Trainer/Light Fighter</td>
<td>Trainer; Light Attack; Trainer/Light Attack; Light Fighter; Adversary Trainer; Flight Demonstration</td>
</tr>
<tr>
<td>Tanker</td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>General; VIP; Special Operations; Search and Rescue; Combat Search and Rescue; Medevac; Trainer; Target Tug</td>
</tr>
<tr>
<td>C4ISR</td>
<td>Airborne Early Warning and Control; Ground Surveillance Radar; Imagery Intelligence; Signal/Electronic Intelligence; Measurement and Signature Intelligence; Multi-Intelligence; Light Observation; Command and Control; Communications Node; Psychological Operations; Border Surveillance; Electronic Attack; Electronic Warfare Trainer</td>
</tr>
<tr>
<td>Maritime</td>
<td>Search and Rescue; Reconnaissance; Surveillance; Patrol; Patrol (Anti-Submarine Warfare)</td>
</tr>
<tr>
<td>Gunship</td>
<td></td>
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<tr>
<td>Firefighter</td>
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<tr>
<td>Flight Inspection</td>
<td></td>
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<tr>
<td>Research</td>
<td></td>
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<tr>
<td>Rotary Wing - Attack</td>
<td></td>
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<tr>
<td>Rotary Wing - Scout</td>
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</tr>
<tr>
<td>Rotary Wing - Transport</td>
<td>General; VIP; Special Operations; Search and Rescue; Combat Search and Rescue; Medevac; Trainer; Assault</td>
</tr>
<tr>
<td>Rotary Wing - Maritime</td>
<td>General; Anti-Submarine Warfare; Airborne Early Warning; Airborne Mine Countermeasures</td>
</tr>
<tr>
<td>Rotary Wing - Electronic Warfare</td>
<td></td>
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<tr>
<td>Rotary Wing - Firefighter</td>
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</tbody>
</table>
Global Toplines
Global Toplines: 2016-2025

- In-Service Fleet: 40,695 in 2016 – 41,808 in 2025
- MRO Annual Market: $70.2B – $72.5B
  - 40% Field, 60% Depot (17% Airframe, 7% Engine, 37% Components)
Global Toplines: 2016-2025

Top 10 Aircraft Families by MRO Demand: 2016-2025

- C-130: $53.44B
- S-70: $53.39B
- F-16: $49.0B
- F/A-18: $40.1B
- F-15: $37.6B
- C-135: $26.3B
- CH-47: $24.8B
- F-35: $23.5B
- H-1: $22.3B
- AH-64: $20.2B

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary
Global Toplines: 2016-2025

Top 10 Aircraft Manufacturers by In-Service Fleet: 2016

- BOEING: 34%
- LOCKHEED-MARTIN: 13%
- SIKORSKY: 12%
- BELL HELICOPTER: 10%
- AIRBUS: 8%
- BEECHCRAFT: 7%
- NORTHROP GRUMMAN: 5%
- CESSNA: 4%
- MCDONNELL-DOUGLAS: 3%
- OTHERS: 2%
- DASSAULT: 2%

Lockheed/Sikorsky = 22% of world fleet;
Top four companies (US) = 43% of world fleet;
Top ten companies = 66% of world fleet

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary
U.S. Military Fleet and MRO Projections
U.S. Market Toplines

U.S. Aircraft In-Service Fleets by Mission Category: 2016-2025

U.S. In-Service Fleet: 14,143 Aircraft in 2016

Source: Aviation Week 2016 Fleet & MRO Forecasts  Proprietary
U.S. MRO Demand by Operator - 2016

- UNITED STATES AIR FORCE
- UNITED STATES ARMY
- UNITED STATES NAVY
- UNITED STATES MARINE CORPS
- UNITED STATES SOCOM
- UNITED STATES COAST GUARD
- OTHERS

MRO Market:
$37.3B in 2016 – $38.3B in 2025
$377B over 2016-2025, 53% of Global Total
## U.S. MRO Demand by Mission Category: 2016-2025

<table>
<thead>
<tr>
<th>Mission Category</th>
<th>2016 Demand ($B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fighter</td>
<td>10.855</td>
</tr>
<tr>
<td>Rotary Wing - Transport</td>
<td>7.527</td>
</tr>
<tr>
<td>Transport</td>
<td>5.320</td>
</tr>
<tr>
<td>Tanker</td>
<td>3.189</td>
</tr>
<tr>
<td>C4ISR</td>
<td>2.718</td>
</tr>
<tr>
<td>Bomber</td>
<td>1.817</td>
</tr>
<tr>
<td>Rotary Wing - Attack</td>
<td>1.838</td>
</tr>
<tr>
<td>Trainer / Light Fighter</td>
<td>1.157</td>
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<tr>
<td>Maritime</td>
<td>1.004</td>
</tr>
<tr>
<td>Rotary Wing - Maritime</td>
<td>0.993</td>
</tr>
<tr>
<td>Gunship</td>
<td>0.220</td>
</tr>
<tr>
<td>Rotary Wing - Scout</td>
<td>0.459</td>
</tr>
<tr>
<td>Research</td>
<td>0.108</td>
</tr>
<tr>
<td>Rotary Wing – EW</td>
<td>0.030</td>
</tr>
<tr>
<td>Target Drone</td>
<td>0.015</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>37.252</strong></td>
</tr>
</tbody>
</table>

Source: Aviation Week 2016 Fleet & MRO Forecasts  Proprietary
Top 10 U.S. Aircraft Families by MRO Demand: 2016-2025
U.S. Fighters

U.S. Fighter In-Service Fleets: 2016-2025

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary
FY14 OCPFH (Mx):
- F-15C/D: $38K ($25K)
- F-15E: $33K ($21K)
- F-16C: $21K ($13K)
- F/A-18: $23K ($13K)
- F-22: $53K ($40K)
- F-35A (est.): $34K ($15K)

MRO Market: $10.9B in 2016
U.S. Trainers & Light Fighters

U.S. Trainer and Light Fighter In-Service Fleets: 2016-2025

- OV-10
- Alpha Jet
- T-34
- MB339
- A-4
- DA40
- SR20
- DA20
- T-X
- L-39
- Hawk (T-45)
- T-38/F-5
- T-6

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary
U.S. Trainers & Light Fighters

Top 5 U.S. Trainer and Light Fighter Families by MRO
Demand: 2016-2025

MRO Market: $1.23B in 2016

Source: Aviation Week 2016 Fleet & MRO Forecasts  Proprietary
U.S. Tankers

MRO Market: $3.2B in 2016
U.S. Transports

Top 10 U.S. Transport In-Service Fleets: 2016-2025

In-Service Fleet: 1,402 – 1,396

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary
Top 10 U.S. Transport Families by MRO Demand: 2016-2025

MRO Market: $5.3B in 2016
U.S. C4ISR Aircraft

Top 10 U.S. C4ISR Aircraft In-Service Fleets: 2016-2025

In-Service Fleet: 300 – 282

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary
Top U.S. C4ISR Aircraft Families by MRO Demand: 2016-2025

MRO Market: $2.7B in 2016
U.S. Maritime Aircraft

In-Service Fleet: 203 – 211 – 182
Top U.S. Maritime Aircraft Families by MRO Demand: 2016-2025

MRO Market: $1B in 2016
U.S. Rotary-Wing Fleet

Top 10 U.S. Rotary-Wing In-Service Fleets: 2016-2025

In-Service Fleet: 6,320 – 6,312
U.S. Rotary-Wing Fleet

Top 5 U.S. Rotary-Wing Families by MRO Demand: 2016-2025

MRO Market: $9.1B in 2016

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary
Thank You