AVIATION WEEK Fleet&MRO FORECASTS

AVIATION WEEK MRO MILITARY

Military Aviation Fleet & MRO Forecast

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AVIATION WEEK NETWORK

Powered by Penton

Agenda

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

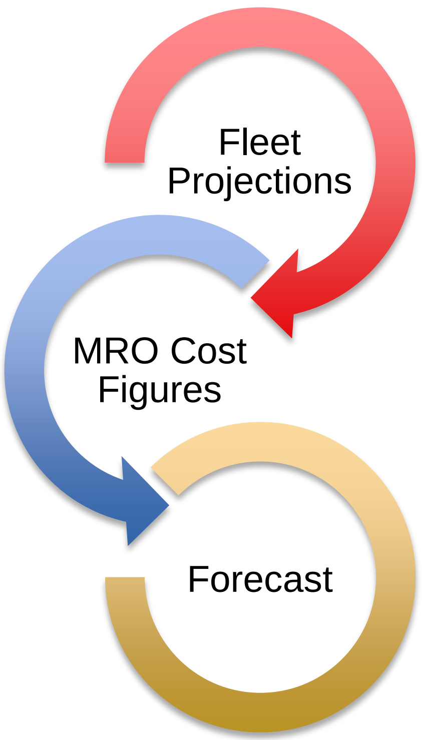
Scope

- 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

AVIATION WEEK Fleet&MRO FORECASTS

- 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

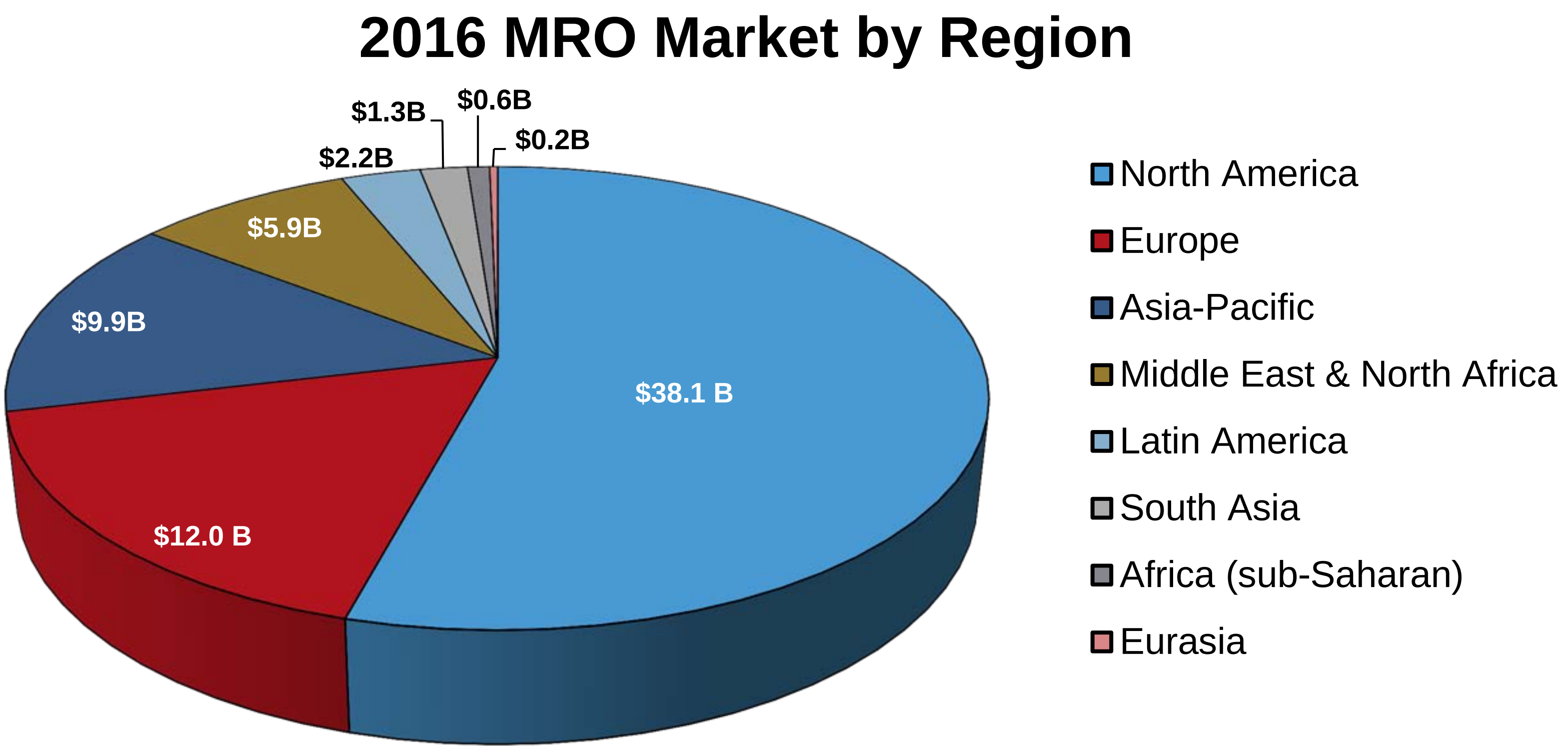
- Field Maintenance
- Airframe Depot Mx
- Engine Depot Mx
- Component Depot MX:
  - Mission Avionics, Cockpit Systems, Landing Gear, Wheels and Brakes, APU, Dynamic Components, Hydraulics, Pneumatics, Fuel system, Electrical System, Other

Mission Categorization

Mission Category	Mission Subcategories
Bomber	
Fighter	Air Superiority, Multi-role, Attack, Electronic Attack, Multi-role (ship-based), flight Demonstration, Adversary Trainer
Trainer/Light Fighter	Trainer; Light Attack; Trainer/Light Attack; Light Fighter; Adversary Trainer; Flight Demonstration
Tanker	
Transport	General; VIP; Special Operations; Search and Rescue; Combat Search and Rescue; Medevac; Trainer; Target Tug
C4ISR	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
Maritime	Search and Rescue; Reconnaissance; Surveillance; Patrol; Patrol (Anti-Submarine Warfare)
Gunship	
Firefighter	
Flight Inspection	
Research	
Rotary Wing - Attack	
Rotary Wing - Scout	
Rotary Wing - Transport	General; VIP; Special Operations; Search and Rescue; Combat Search and Rescue; Medevac; Trainer; Assault
Rotary Wing - Maritime	General; Anti-Submarine Warfare; Airborne Early Warning; Airborne Mine Countermeasures
Rotary Wing - Electronic Warfare	
Rotary Wing - Firefighter	

Global Toplines

Global Toplines: 2016-2025



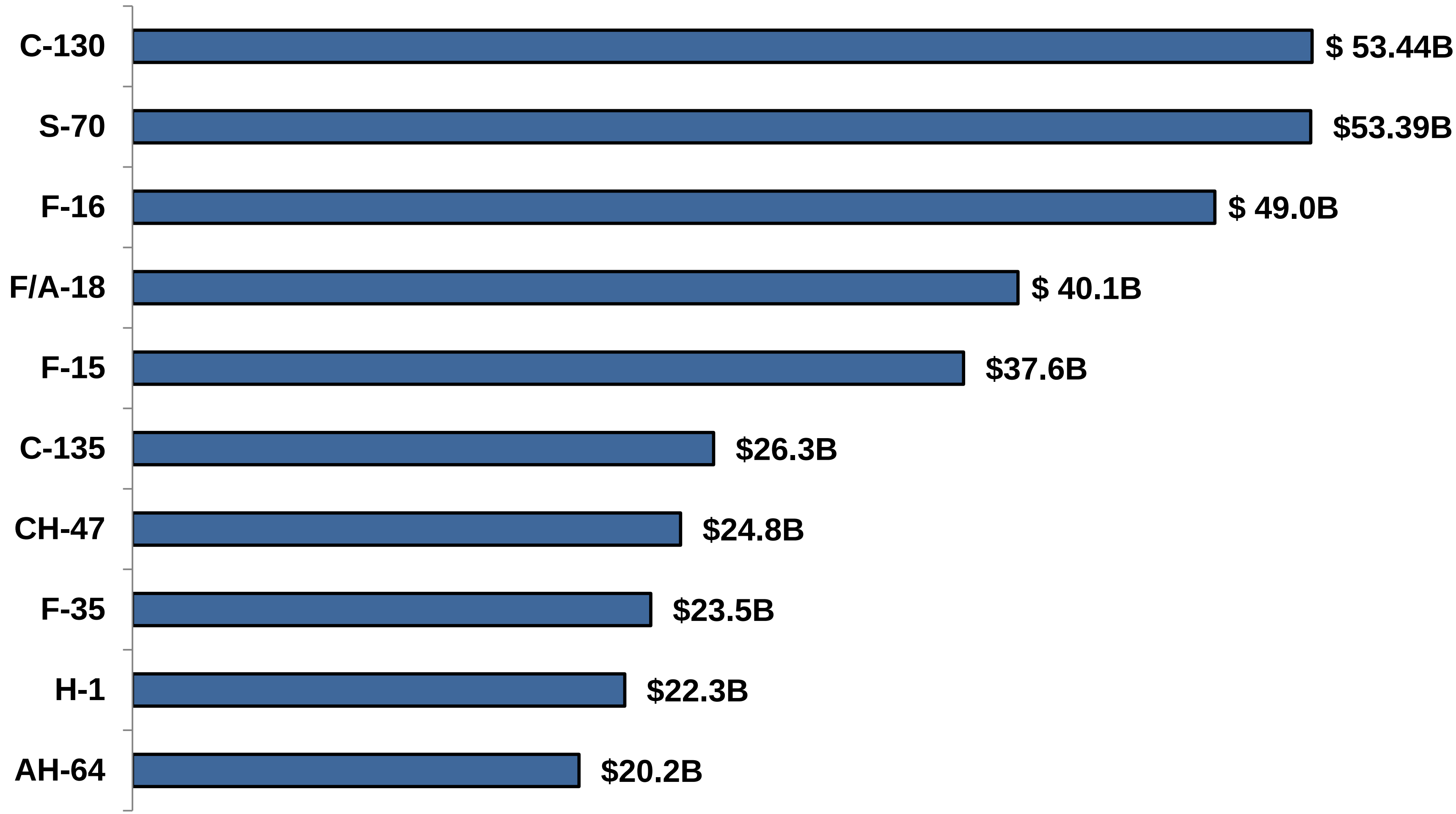
- In-Service Fleet: 40,695 in 2016 – 41,808 in 2025
- MRO Annual Market: $70.2B – $72.5B
  - 40% Field, 60% Depot (17% Airframe, 7% Engine, 37% Components)

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

Global Toplines: 2016-2025

AVIATION WEEK Fleet&MRO FORECASTS

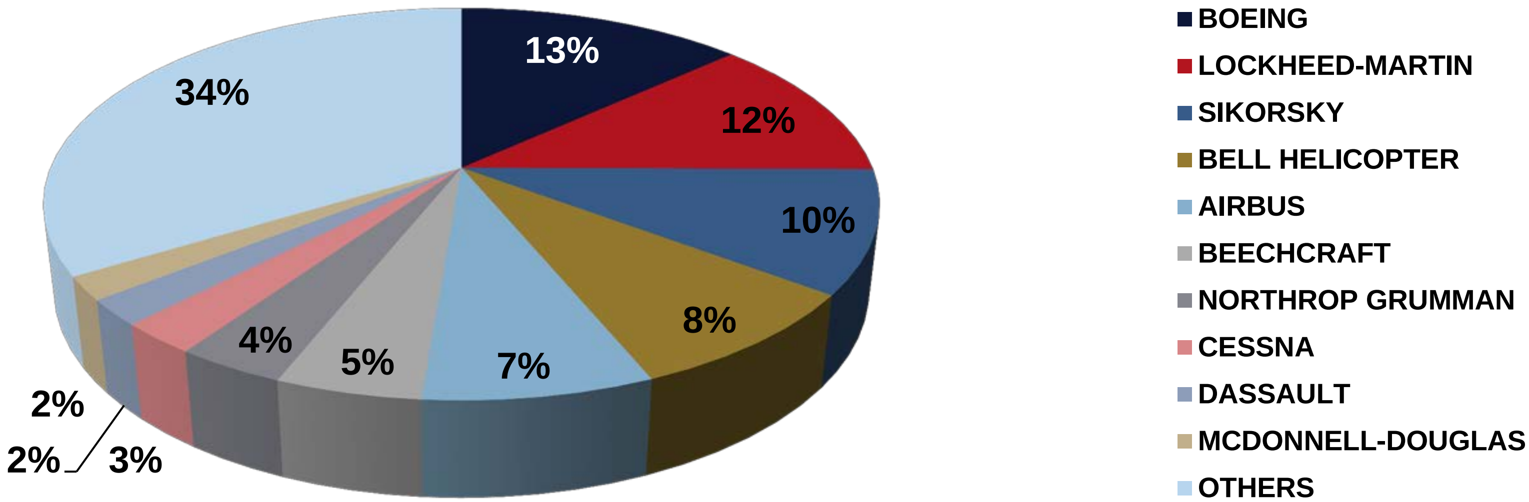
Top 10 Aircraft Families by MRO Demand: 2016-2025



Global Toplines: 2016-2025

AVIATION WEEK Fleet&MRO FORECASTS

Top 10 Aircraft Manufacturers by In-Service Fleet: 2016



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

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U.S. Military Fleet and MRO Projections

U.S. Market Toplines

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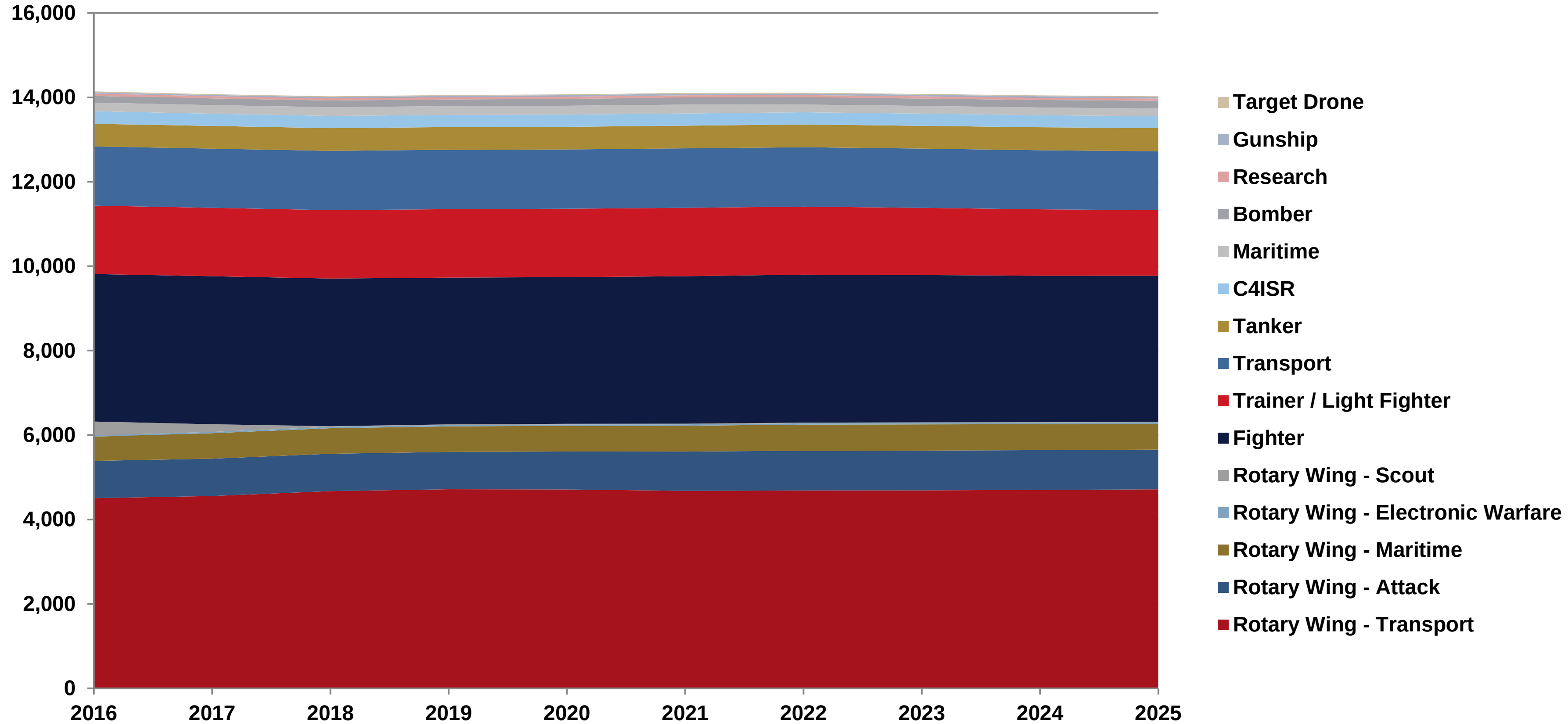
U.S. Aircraft In-Service Fleets by Mission Category: 2016-2025

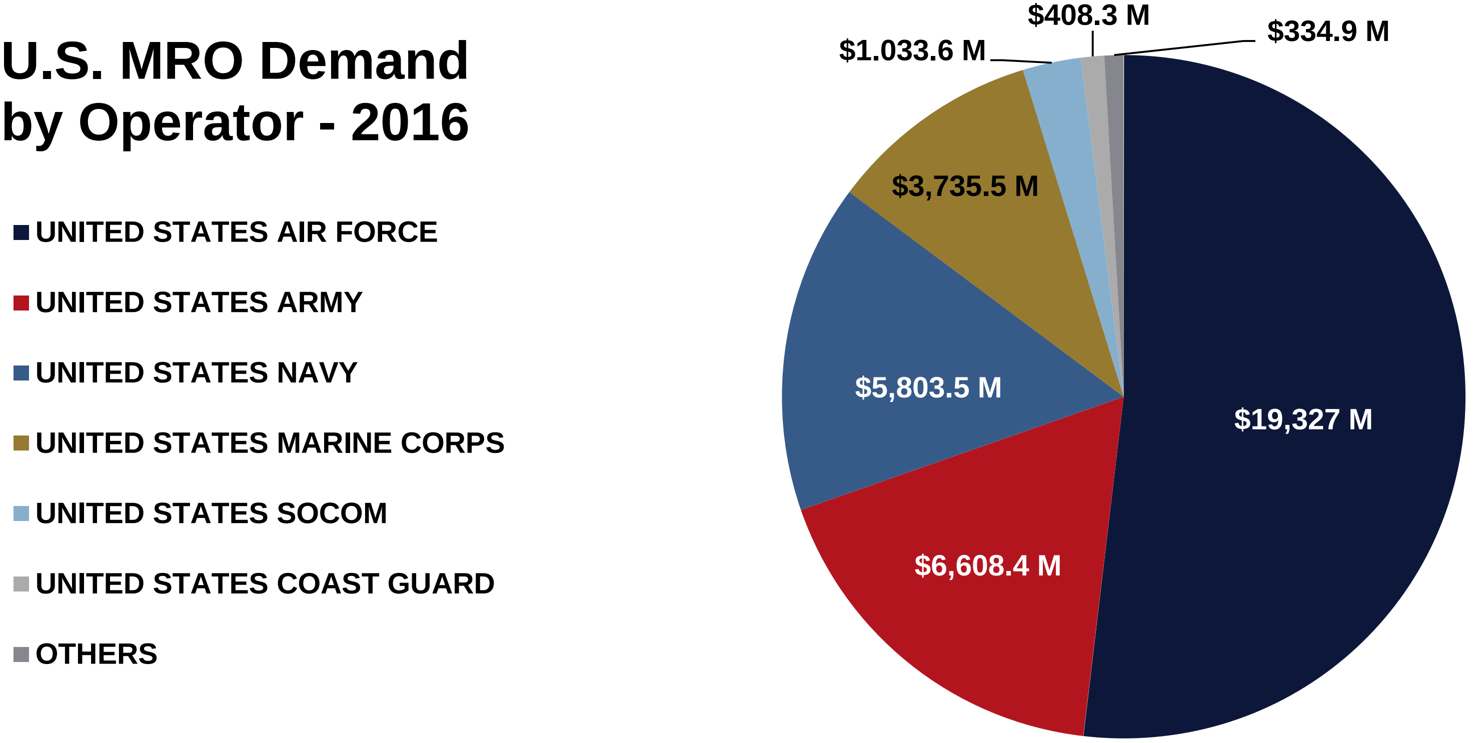


U.S. In-Service Fleet: 14,143 Aircraft in 2016

U.S. Market: MRO by Operator

AVIATION WEEK Fleet&MRO FORECASTS

U.S. MRO Demand by Operator - 2016



MRO Market:
$37.3B in 2016 – $38.3B in 2025
$377B over 2016-2025, 53% of Global Total

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

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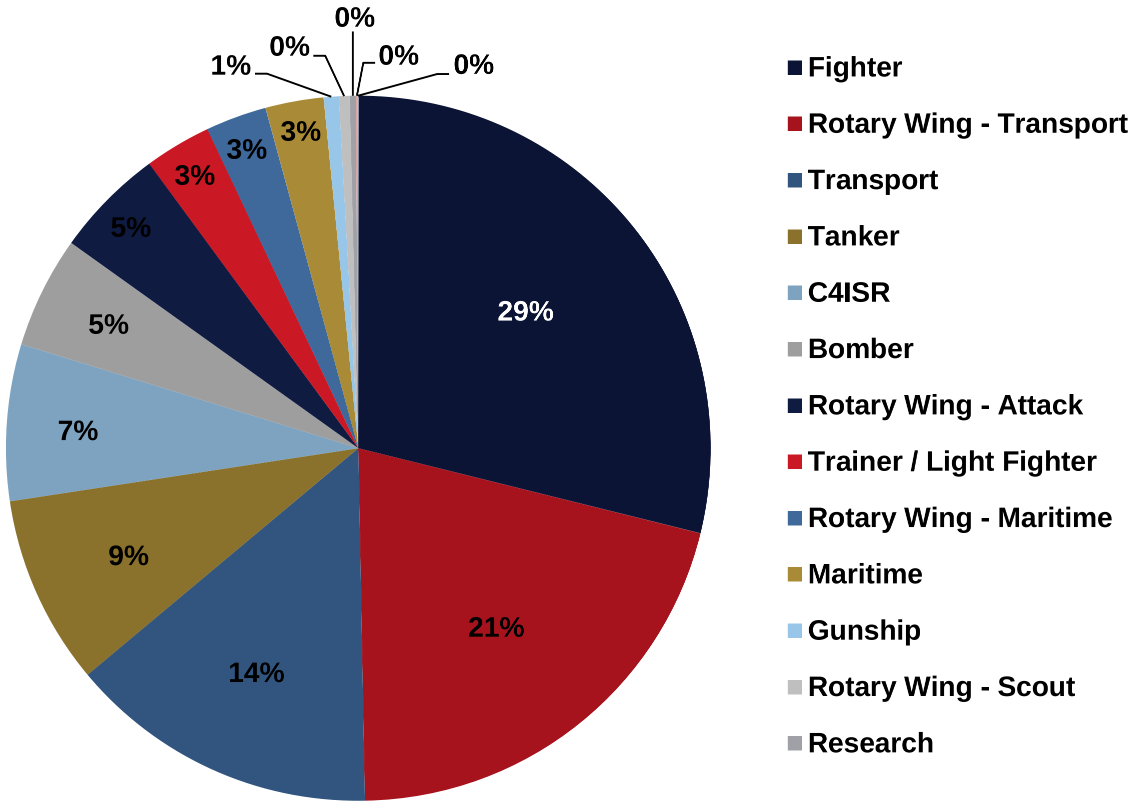
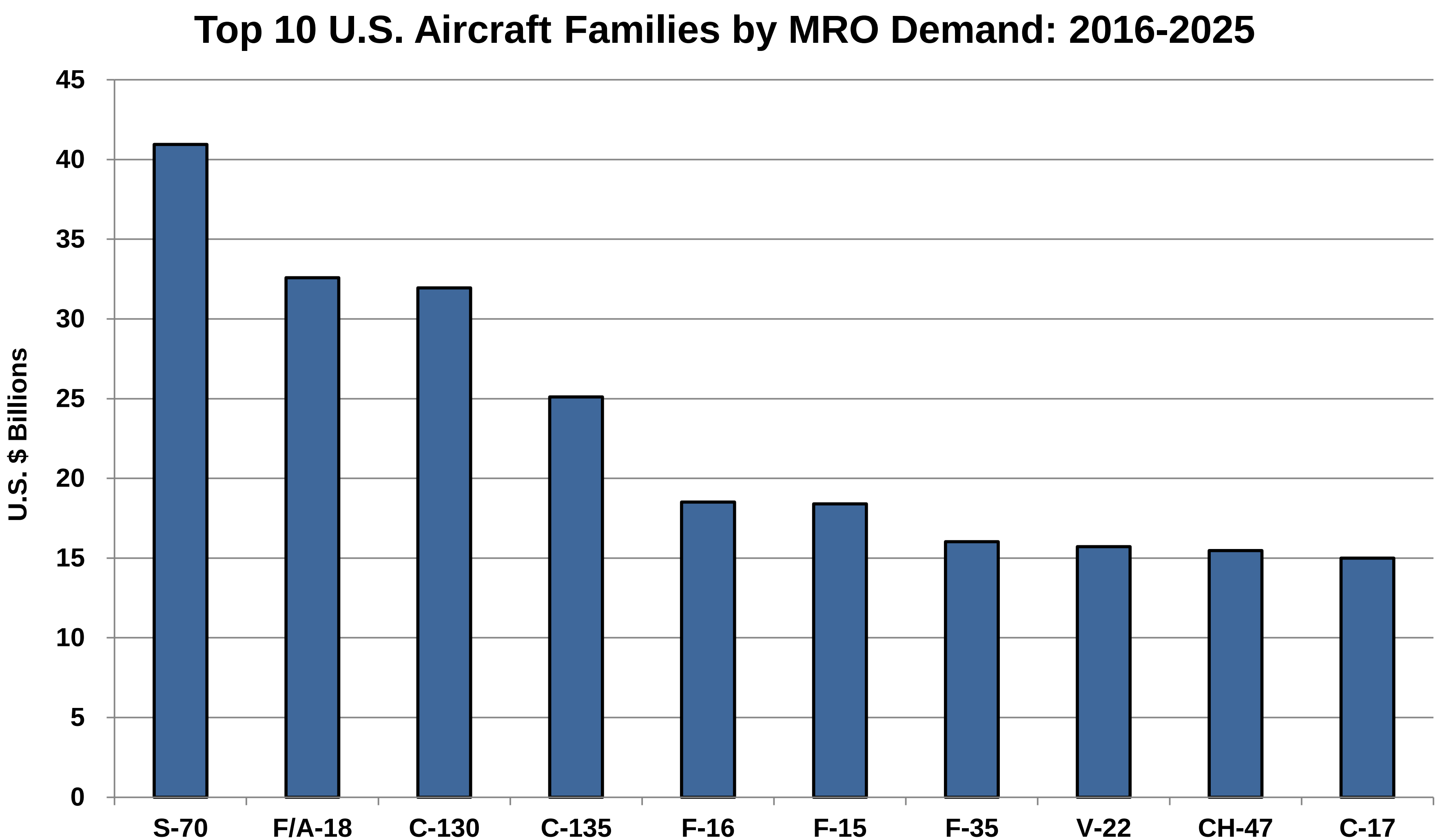
U.S. Market: MRO by Mission

U.S. MRO Demand by Mission Category: 2016-2025

Mission Category	2016 Demand ($B)
Fighter	10.855
Rotary Wing - Transport	7.527
Transport	5.320
Tanker	3.189
C4ISR	2.718
Bomber	1.817
Rotary Wing - Attack	1,838
Trainer / Light Fighter	1.157
Maritime	1,004
Rotary Wing - Maritime	0.993
Gunship	0.220
Rotary Wing - Scout	0.459
Research	0.108
Rotary Wing – EW	0.030
Target Drone	0.015
Total	37.252



U.S. Market: Top Ten Families



Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

U.S. Fighters

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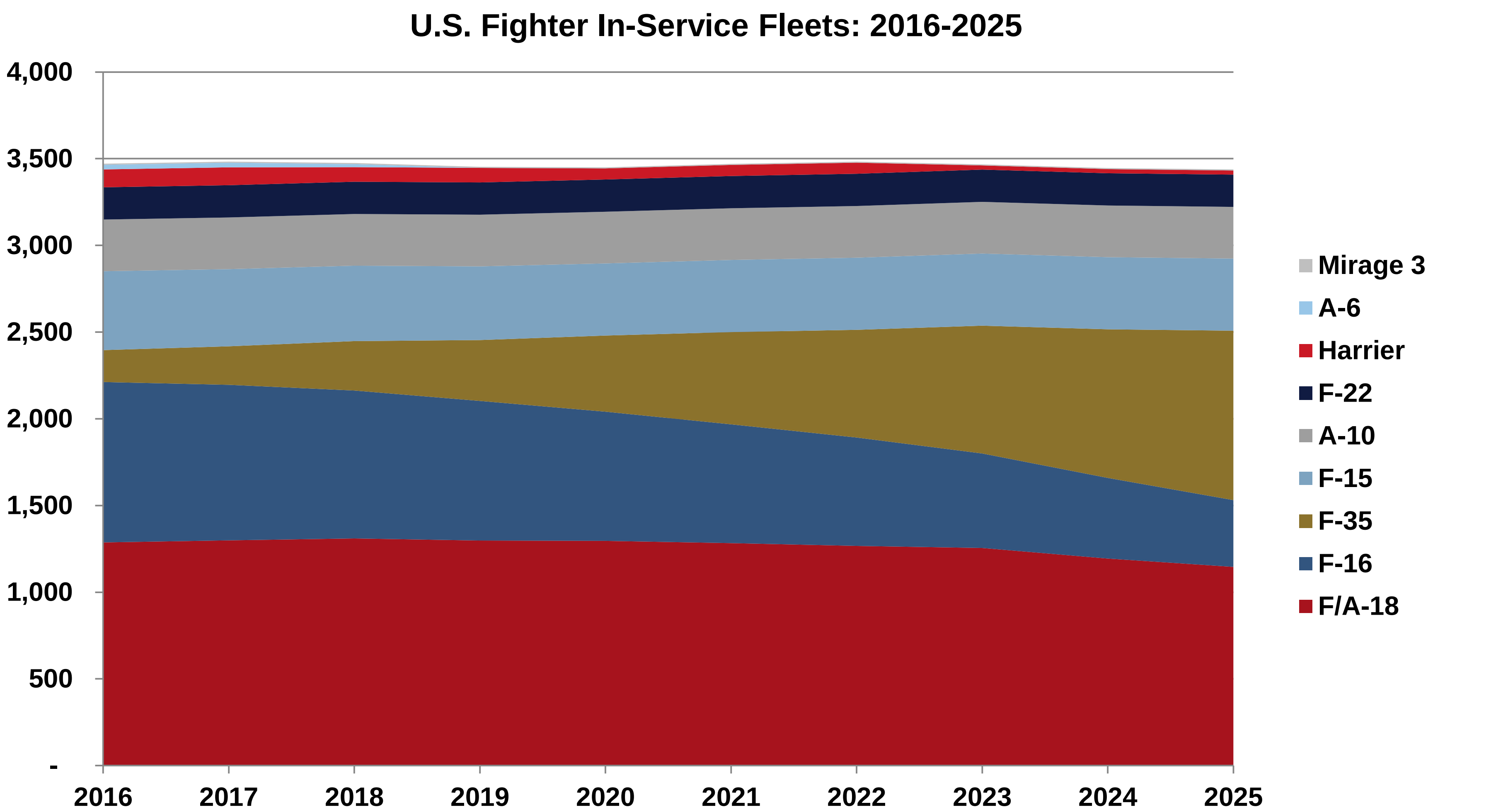
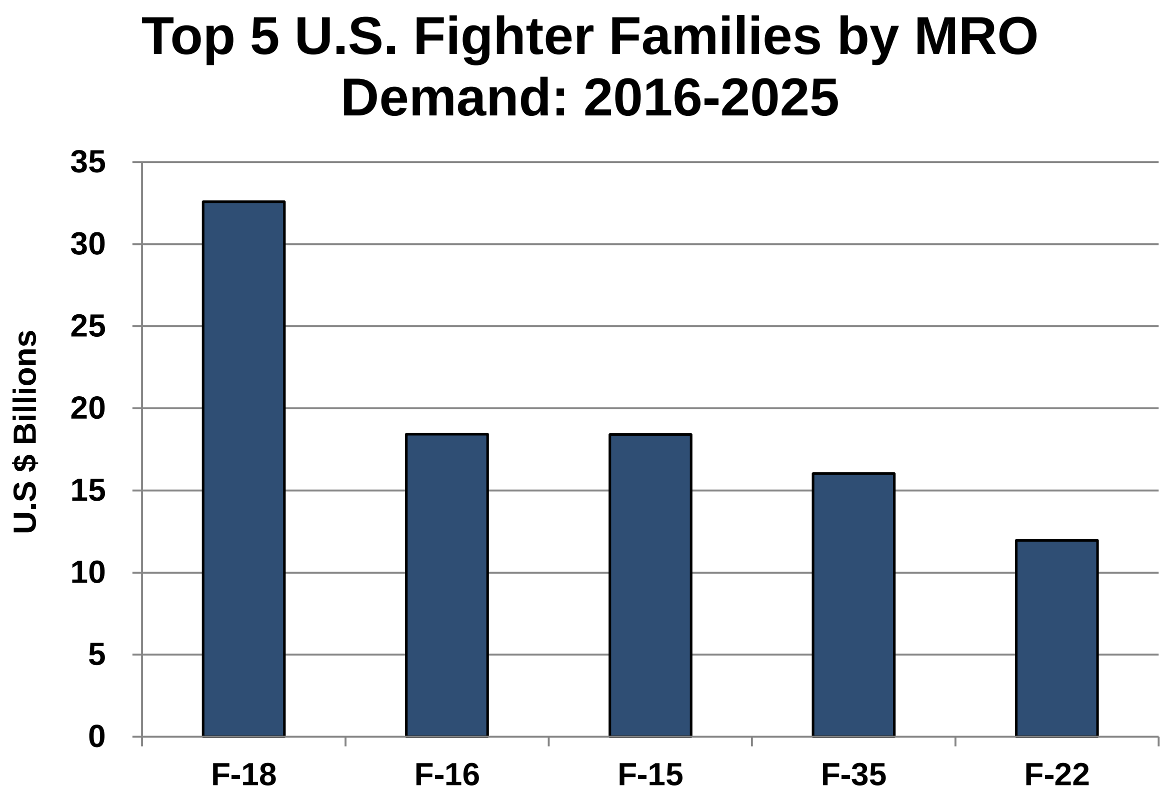


Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

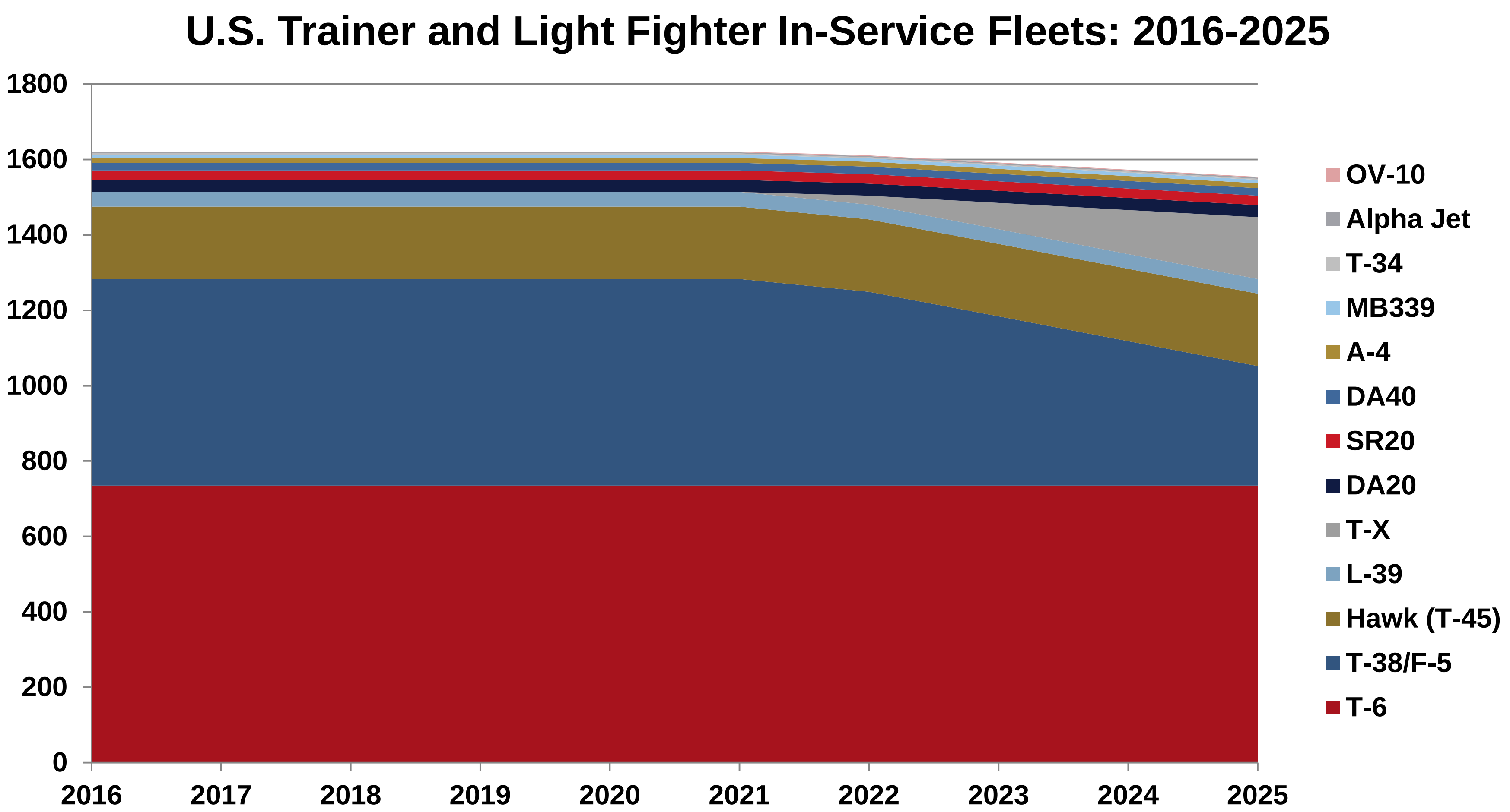
U.S. Fighters

- 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)



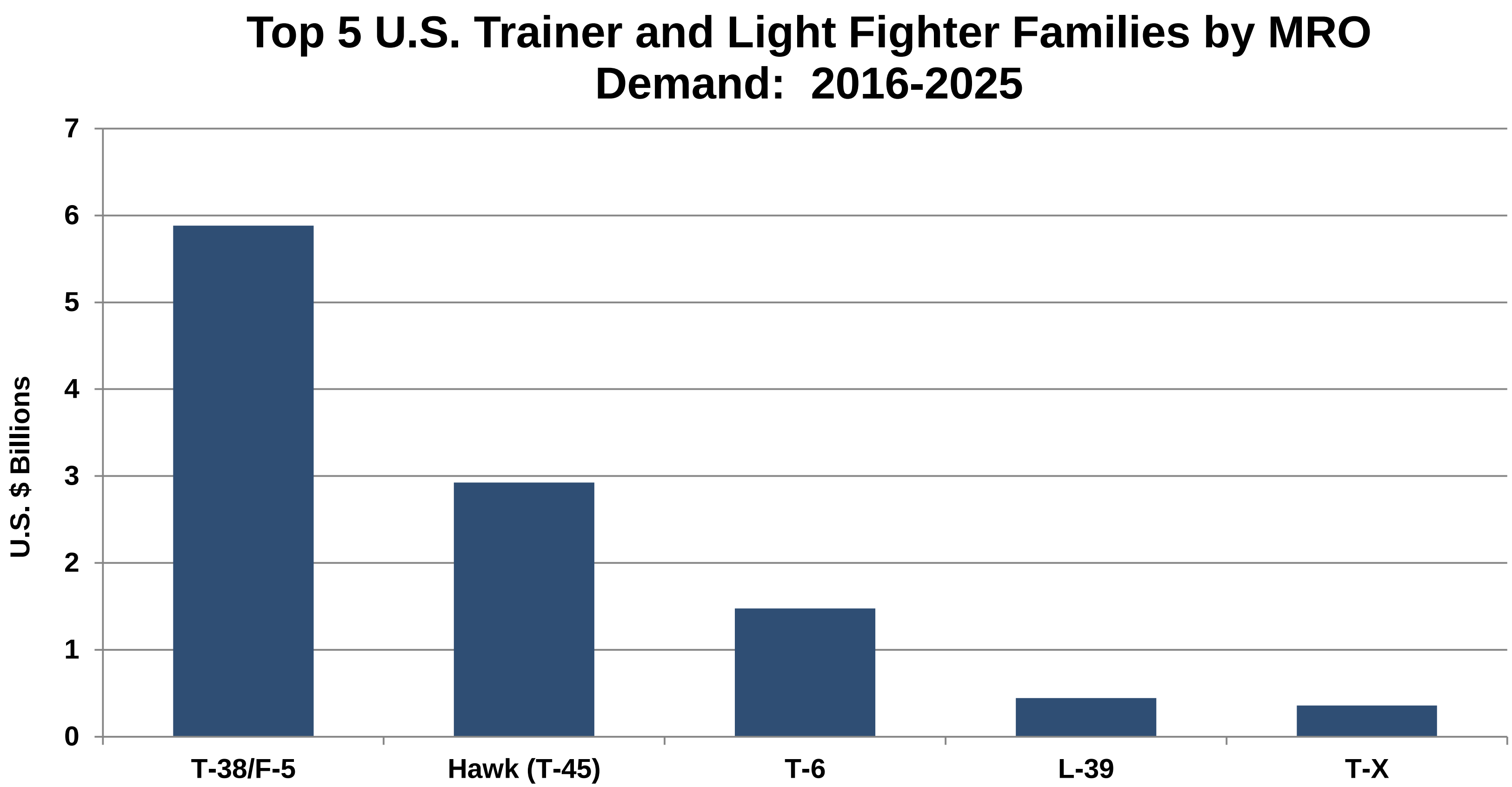
MRO Market: $10.9B in 2016

U.S. Trainers & Light Fighters



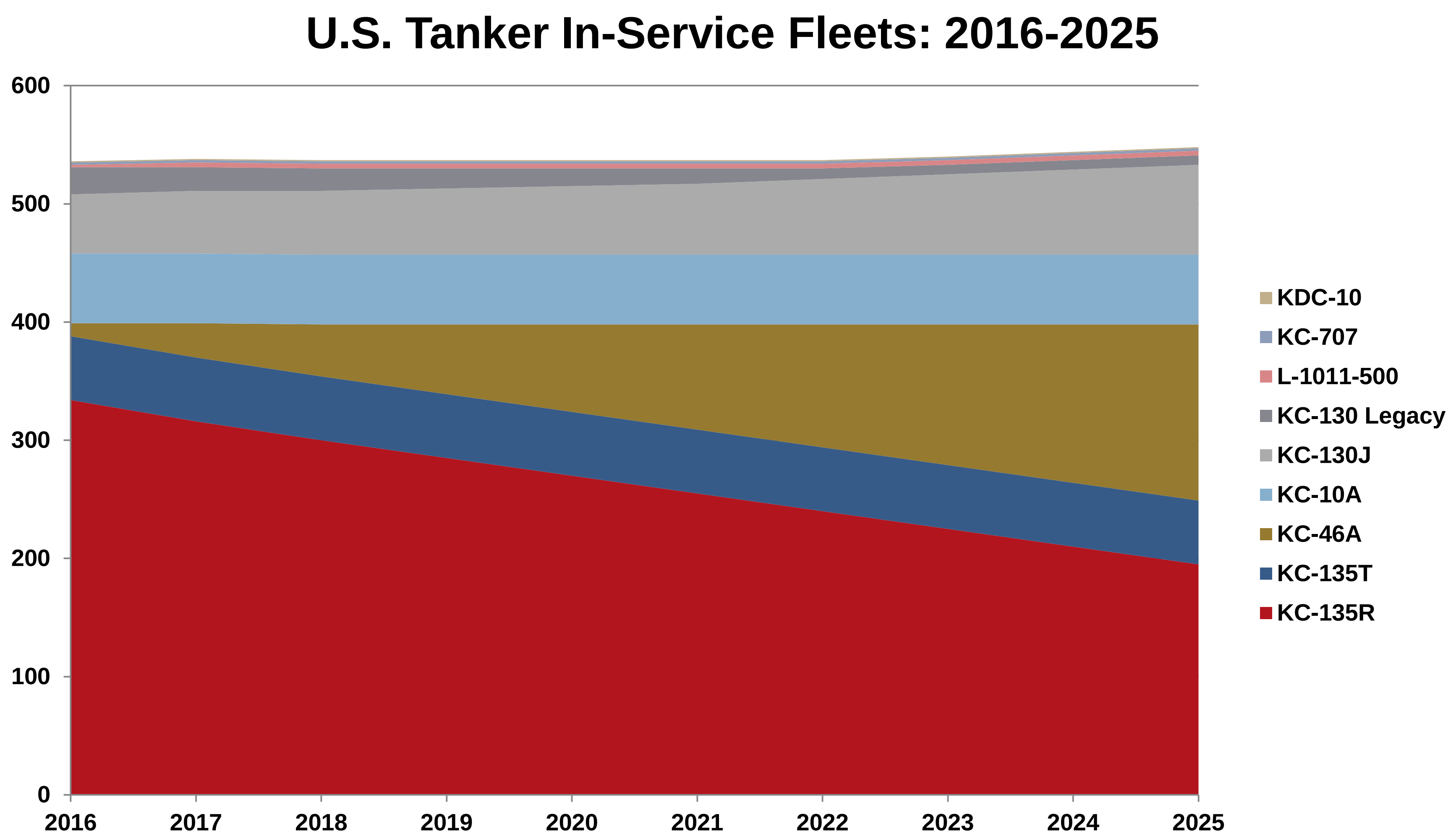
U.S. Trainers & Light Fighters

AVIATION WEEK Fleet&MRO FORECASTS



MRO Market: $1.23B in 2016

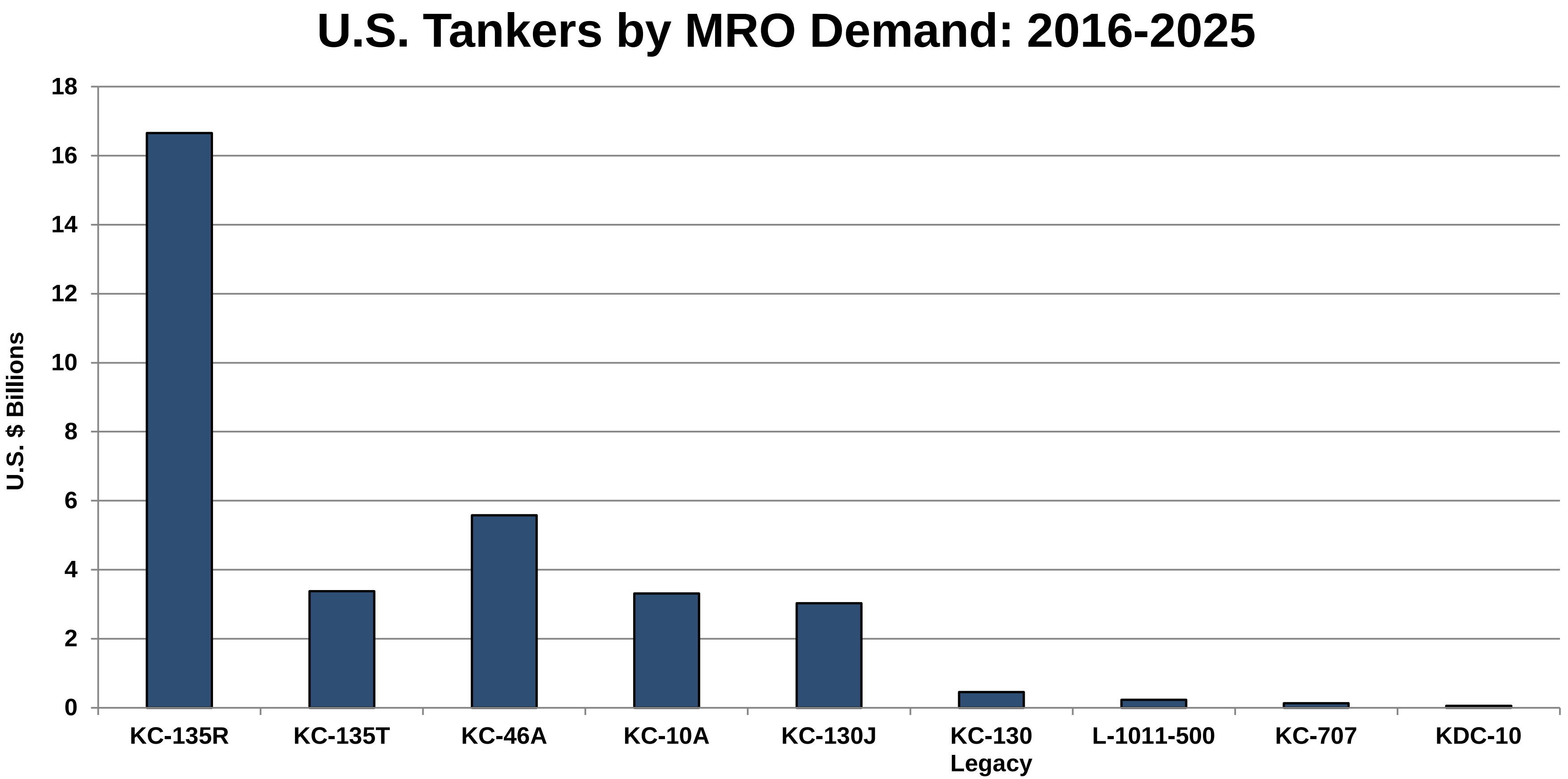
U.S. Tankers



Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

U.S. Tankers

AVIATION WEEK Fleet&MRO FORECASTS



MRO Market: $3.2B in 2016

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

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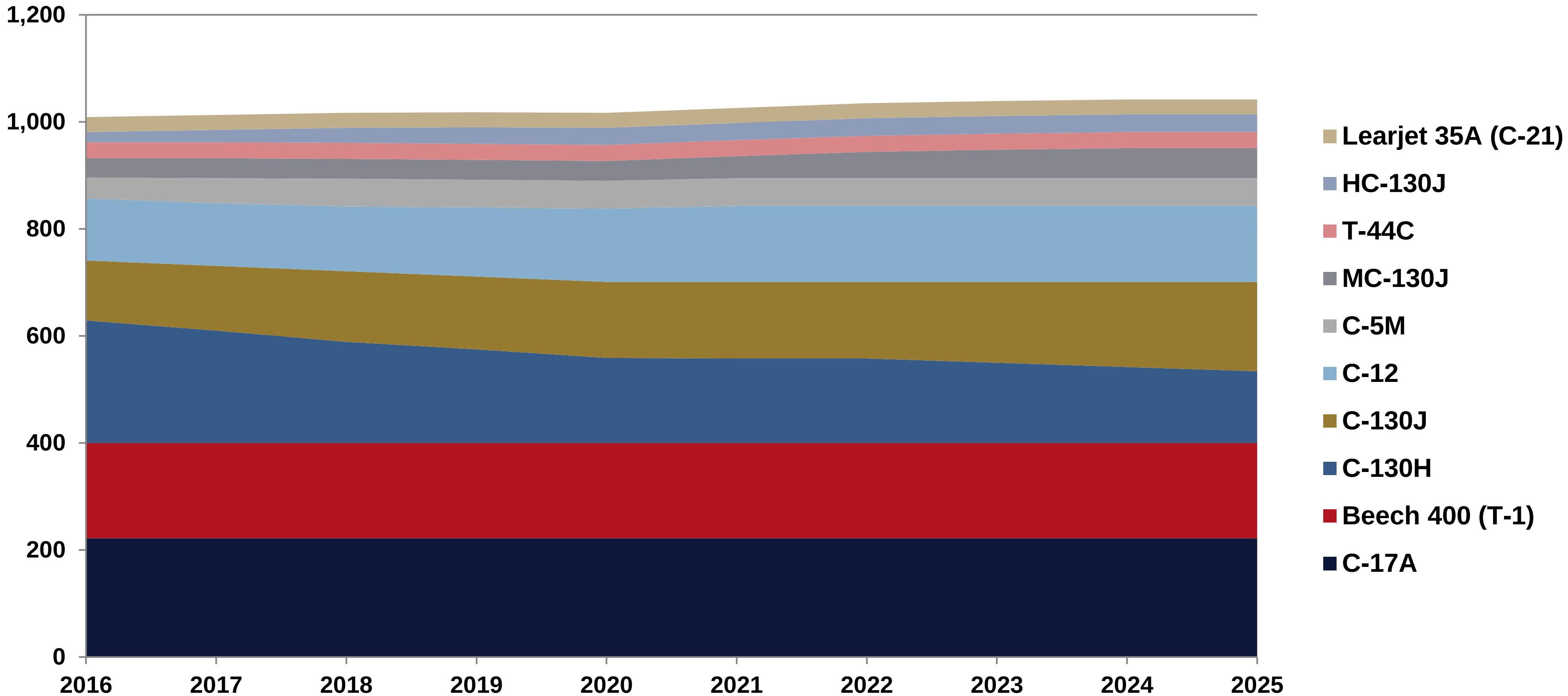
U.S. Transports

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

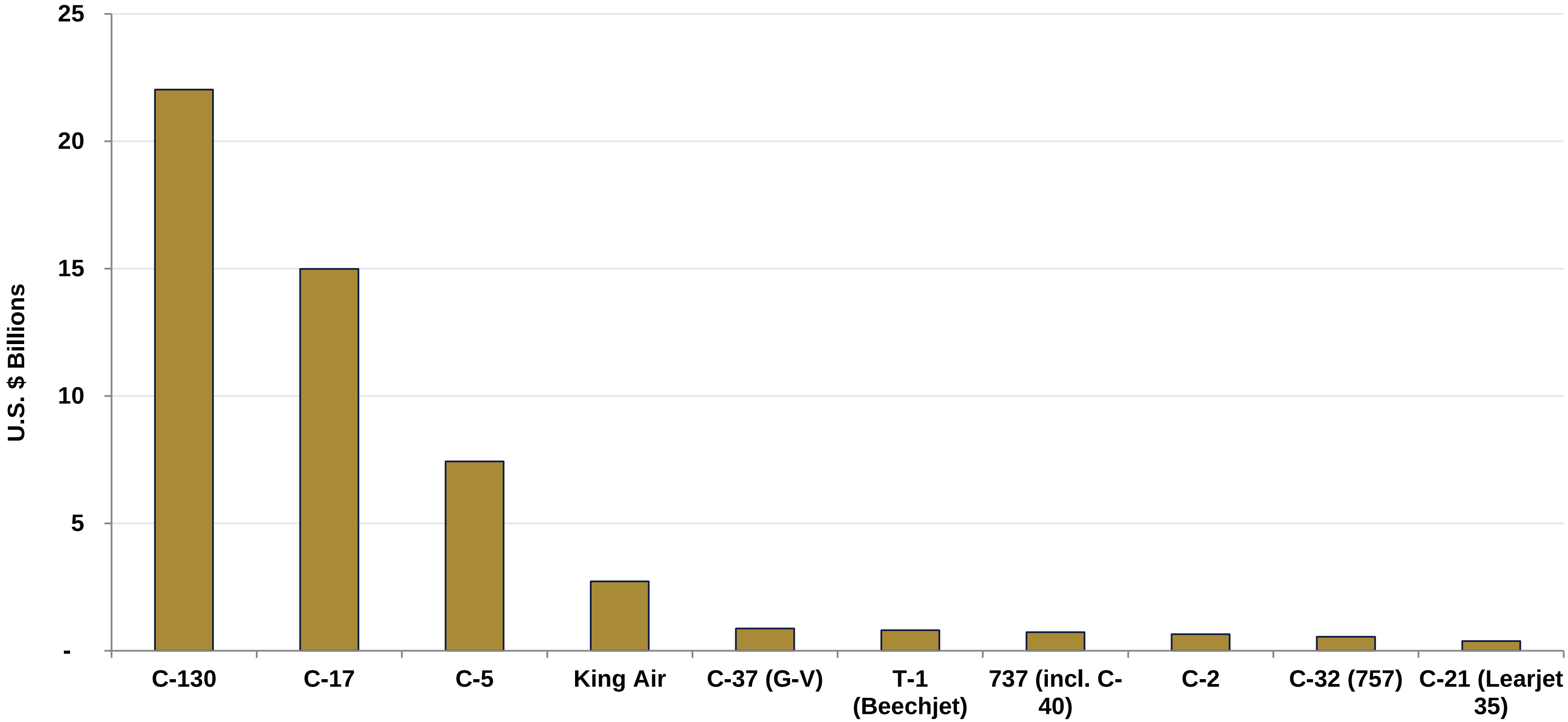


In-Service Fleet: 1,402 – 1,396

U.S. Transports

AVIATION WEEK Fleet&MRO FORECASTS

Top 10 U.S. Transport Families by MRO Demand: 2016-2025



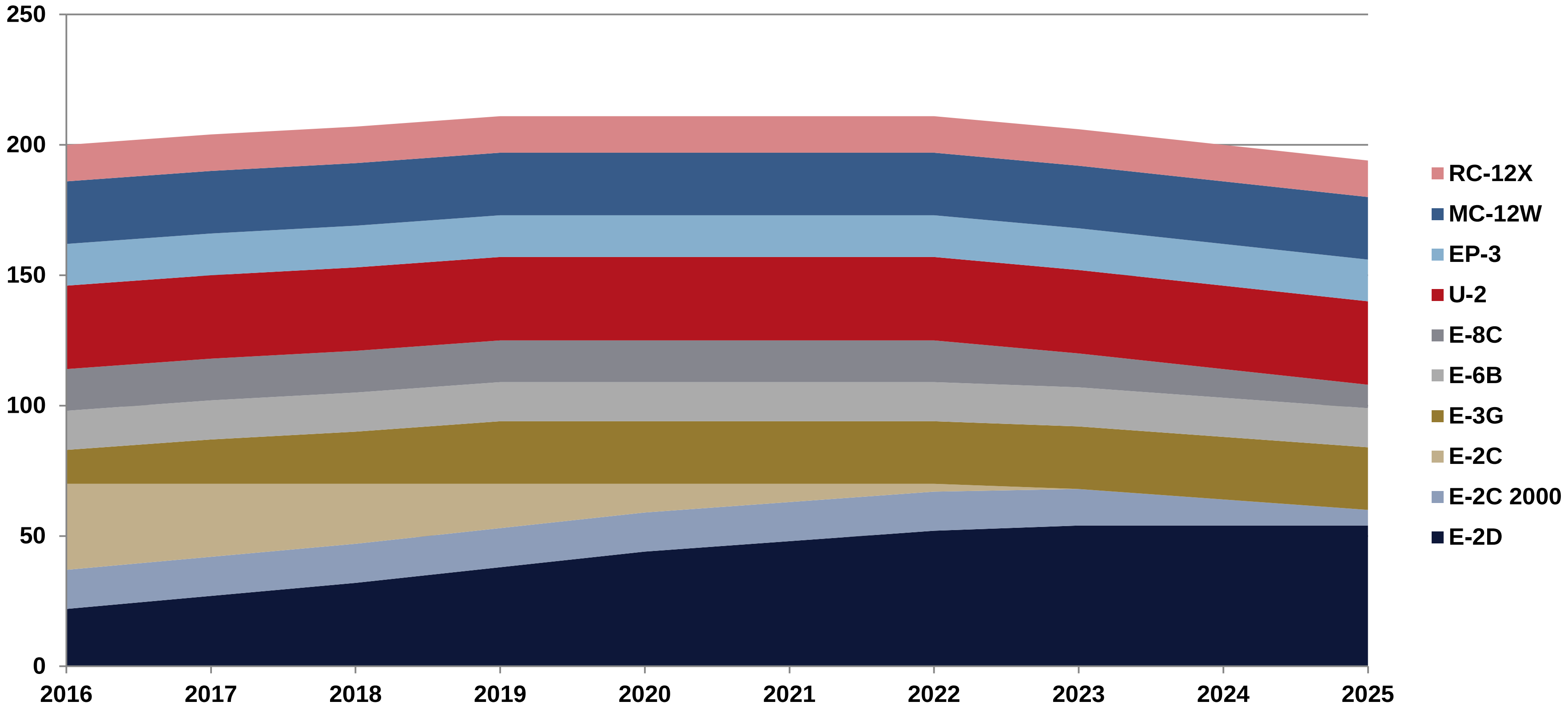
MRO Market: $5.3B in 2016

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

AVIATION WEEK NETWORK

U.S. C4ISR Aircraft

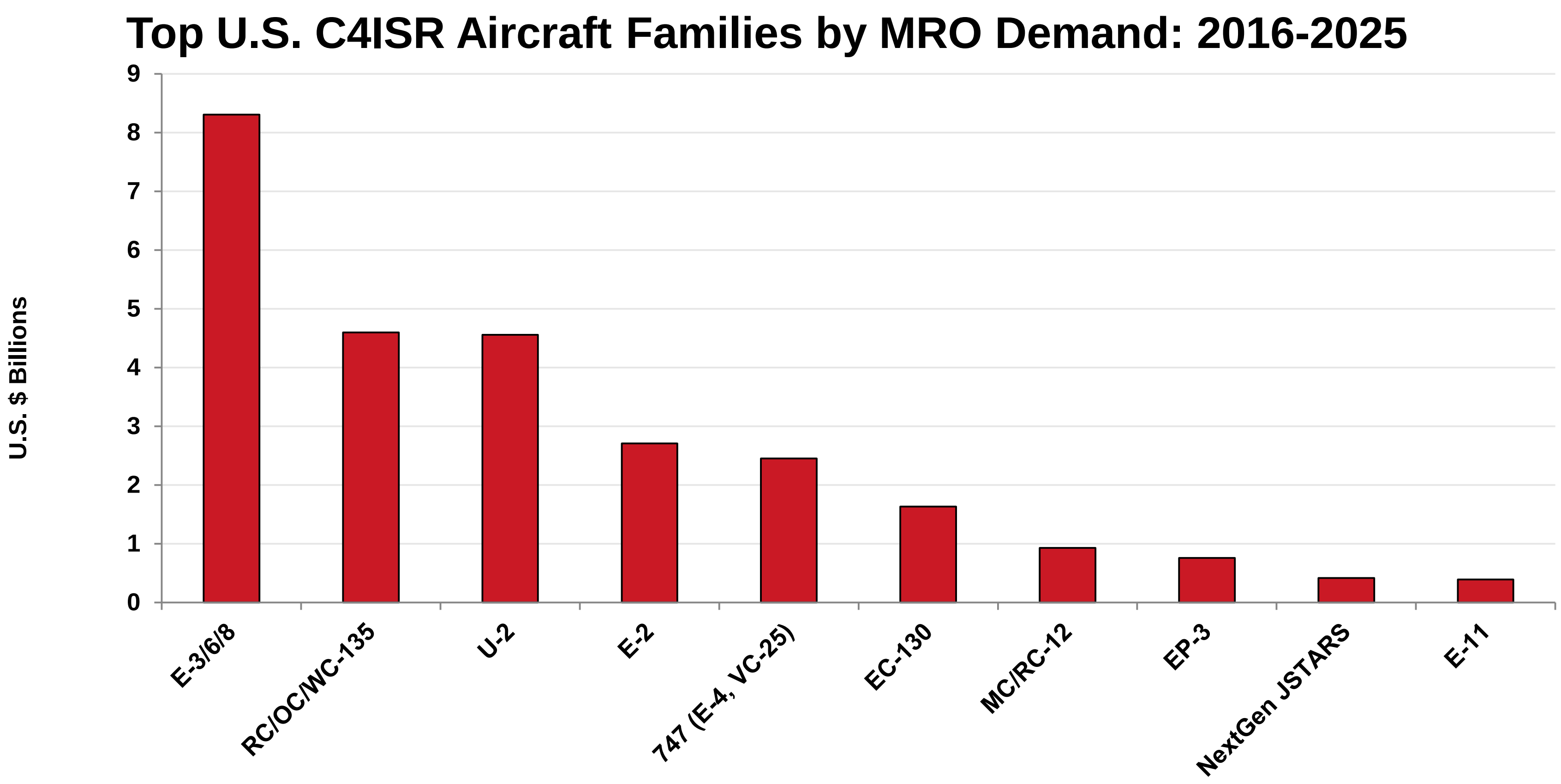
Top 10 U.S. C4ISR Aircraft In-Service Fleets: 2016-2025



In-Service Fleet: 300 – 282

U.S. C4ISR Aircraft

AVIATION WEEK Fleet&MRO FORECASTS



MRO Market: $2.7B in 2016

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

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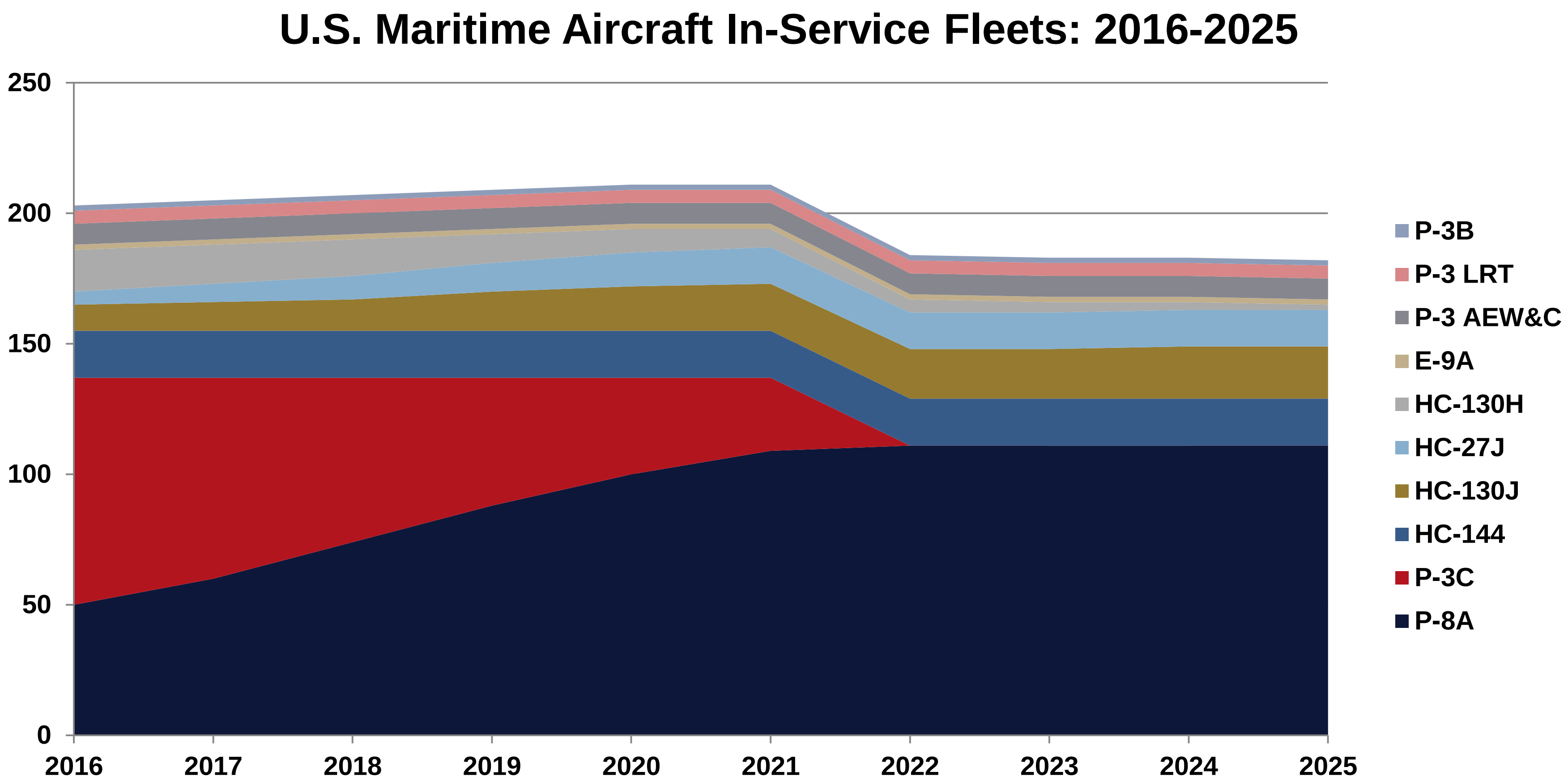
U.S. Maritime Aircraft

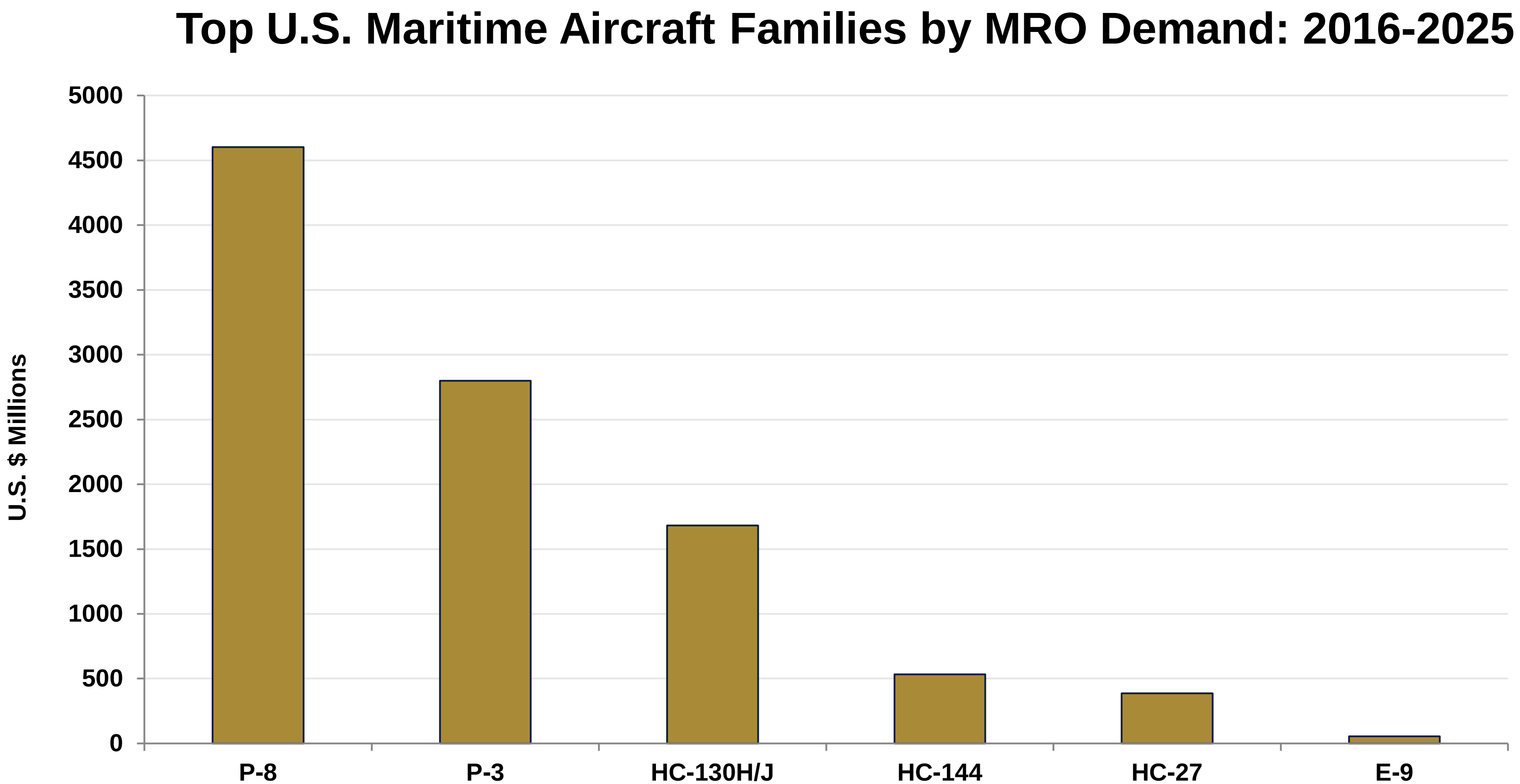


In-Service Fleet: 203 – 211 – 182

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

U.S. Maritime Aircraft

AVIATION WEEK Fleet&MRO FORECASTS



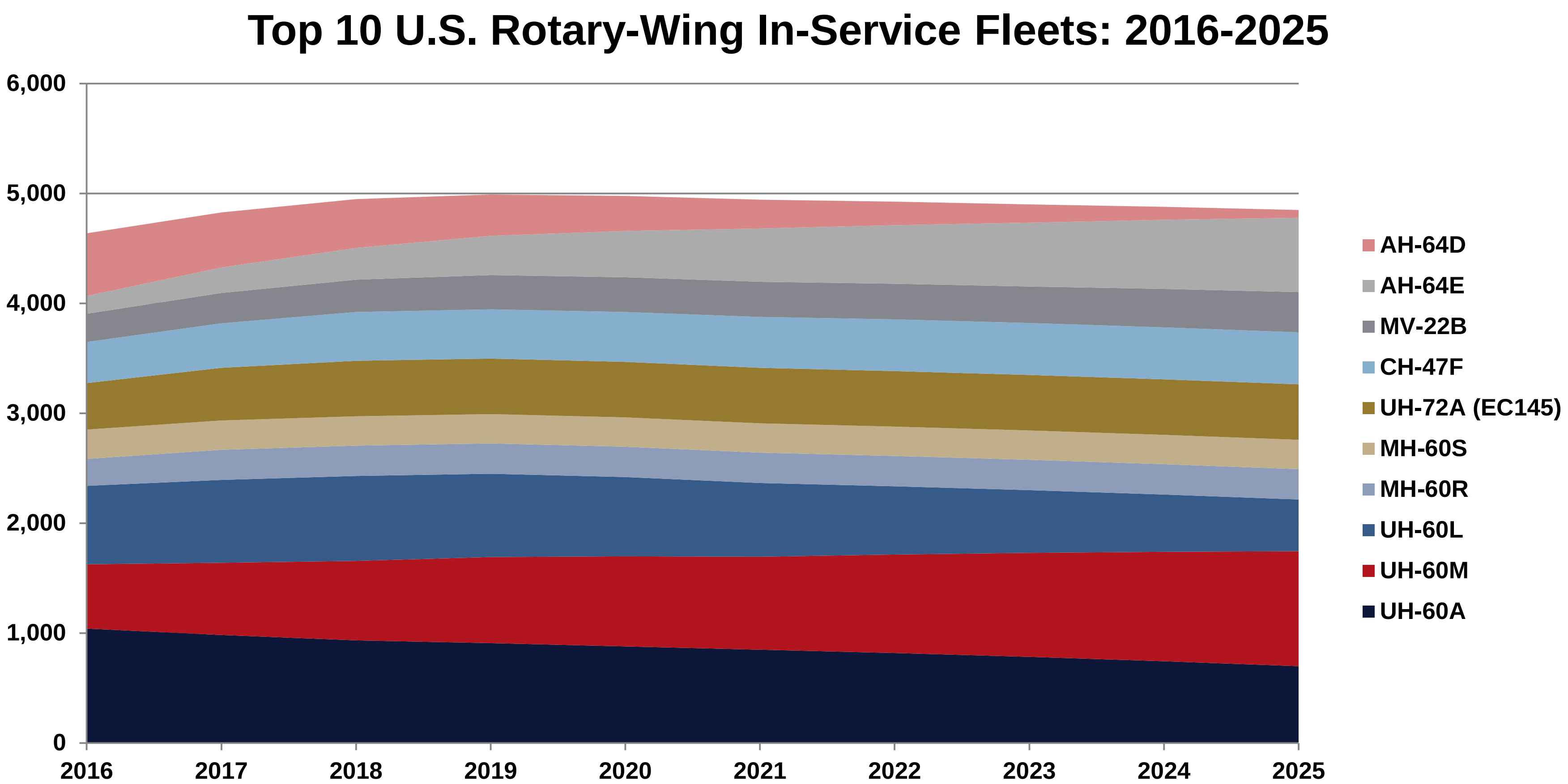
MRO Market: $1B in 2016

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

AVIATION WEEK NETWORK

U.S. Rotary-Wing Fleet

AVIATION WEEK Fleet&MRO FORECASTS



In-Service Fleet: 6,320 – 6,312

U.S. Rotary-Wing Fleet

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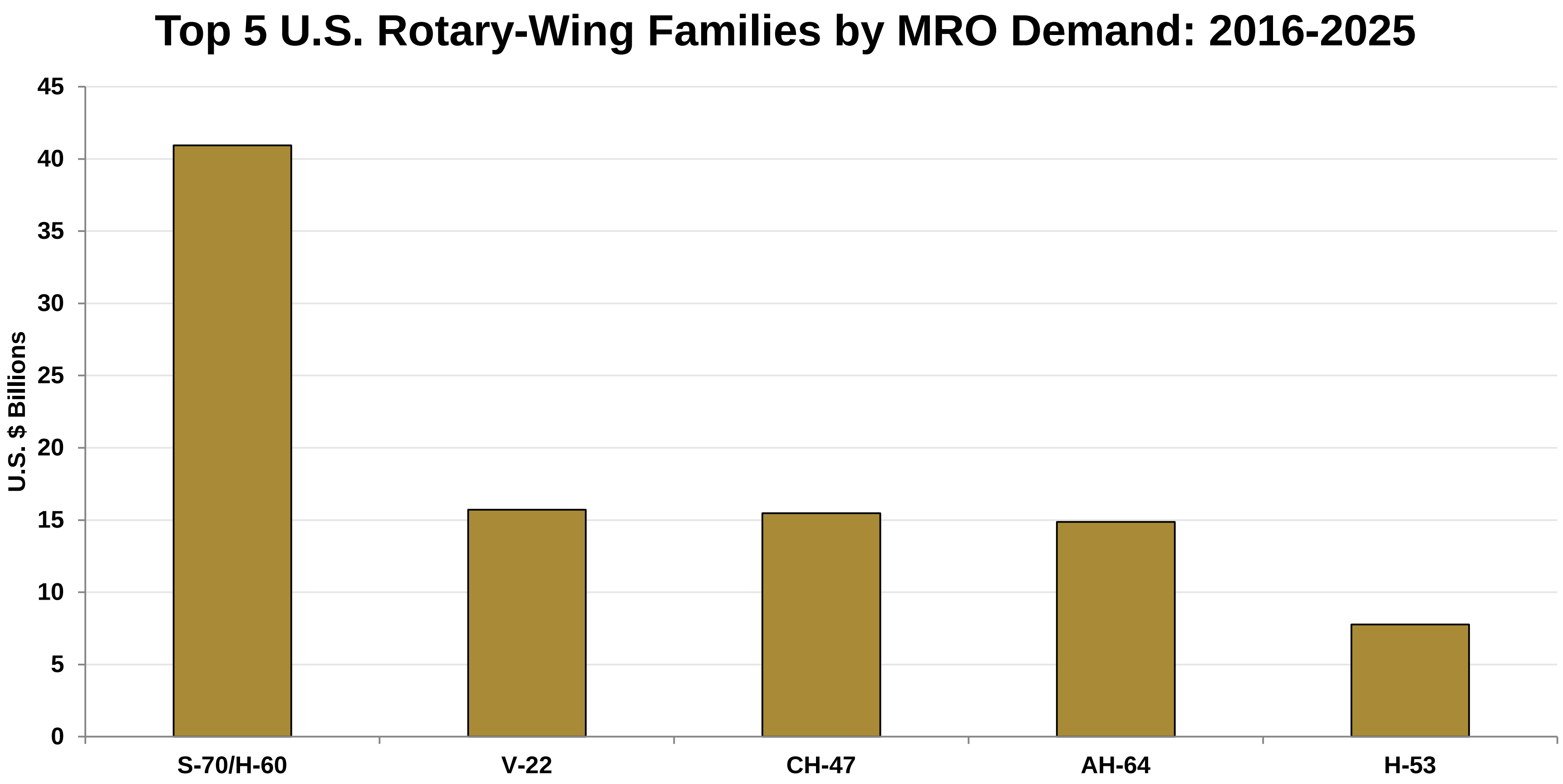

MRO Market: $9.1B in 2016

Source: Aviation Week 2016 Fleet & MRO Forecasts Proprietary

AVIATION WEEK NETWORK

Thank You

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