



**ITALIAN TRADE AGENCY**

Executive Summary

# Analysis of the US Aerospace Market

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# Project Background



**This document represents an executive summary of a final report completed by Cedar for the Italian Trade Agency-Houston of a detailed study of the US aerospace market.**

- “To analyze trade between Italy and the US in the aerospace sector.”
- “To analyze the aerospace industry in the US covering production, imports, exports, employment and other key parameters.”
- “To analyze the regulatory framework of the US aerospace market covering export/import regulations, quality standards, trade policies and other government- and industry-sponsored regulations and standards,”
- “To analyze private and private/public funds/grants for R&D activities in the US Aerospace sector accessible by Italian companies and research institutions.”

# Project Background



**The final report and this executive summary are based on inputs from interviews on the US A&D market and opinions of Italian aerospace suppliers:**

- 125 Interviews were completed including the top 109 aerospace companies that agreed to be interviewed.
- This executive summary and final report includes US aerospace companies' perspectives and opinions of Italian suppliers.

# US Aerospace Market Overview



**The US aerospace market has moved from a relatively weak position in growth and revenues to a strong position. The US aerospace industry declined in 2015-2017 but has grown dramatically in 2018.**

- The Trump administration has increased the A&D budget to pre-sequestration levels and actually increased some aspects of the defense budget.
- The Trump administration has also imposed tariffs on China and allies alike. Aerospace products from China will be taxed at higher rates, causing US aerospace companies either to pay higher prices or seek new sources.

# US Aerospace Market Overview

US Aerospace Production Revenues (\$Billions)						
	2013	2014	2015	2016	2017	2013-2017 % CAGR
Commercial Aviation	\$291	\$293	\$319	\$335	\$344	4.3%
Defense (Ex-Marine)	234	236	225	190	188	(5.3)
Space	35	39	47	52	56	12.5
General Aviation	7	5	6	7	7	0
Total	\$567	\$573	\$597	\$584	\$595	1.2%

Note: Includes manufacturing only; excludes financial, professional and IT services. Excludes passenger and freight airline revenues. US production only, including exports. Source: AIA, FAA, GAMA

# US Aerospace Market Overview

US Aerospace Production, Exports, Imports (\$Billions)					
	2013	2014	2015	2016	2017
Domestic Production	\$567	\$573	\$597	\$584	\$595
Exports	120	130	137	140	140
Imports	51	57	59	54	55
Apparent Consumption	\$498	\$500	\$519	\$498	\$510
Trade Balance	\$69	\$73	\$78	\$86	\$85
Total US Production plus Imports	\$618	\$630	\$656	\$638	\$650

Source: AIA, FAA, GAMA

# US Aerospace Market Overview

US Aerospace Imports and Top Source Countries and Products (\$Billions)					
	2013	2014	2015	2016	2017
<b>Commercial Aviation</b>	\$47	\$53	\$55	\$49	\$50
<b>Defense (Includes Space; excludes Marine)</b>	3	4	4	4	4
<b>General Aviation</b>	1	<1	<1	1	1
<b>Total</b>	\$51	\$57	\$59	\$54	\$55

**FRANCE: Completed Aircraft, Completed Air Frames**  
**CANADA: Completed Aircraft, Aircraft Components**  
**JAPAN: Aircraft Components**  
**GERMANY: Completed Aircraft, Aircraft Components**  
**UK: Completed Aircraft, Aircraft Components**

Source: International Trade Administration, Office of Transportation and Machinery, AIA

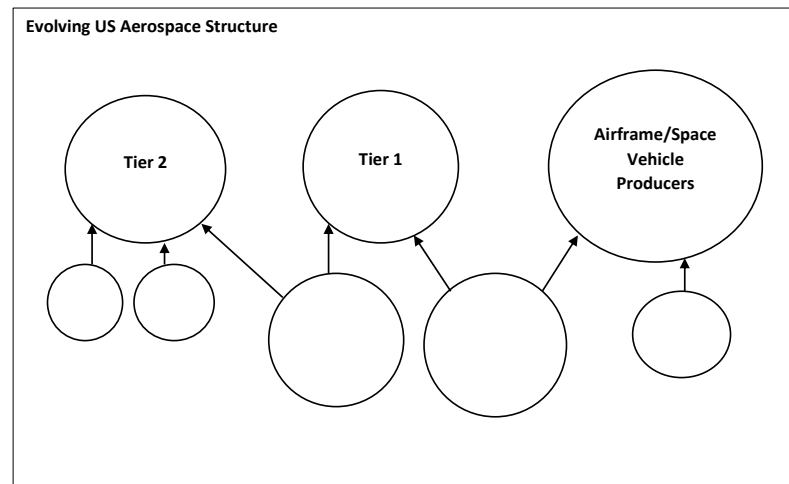
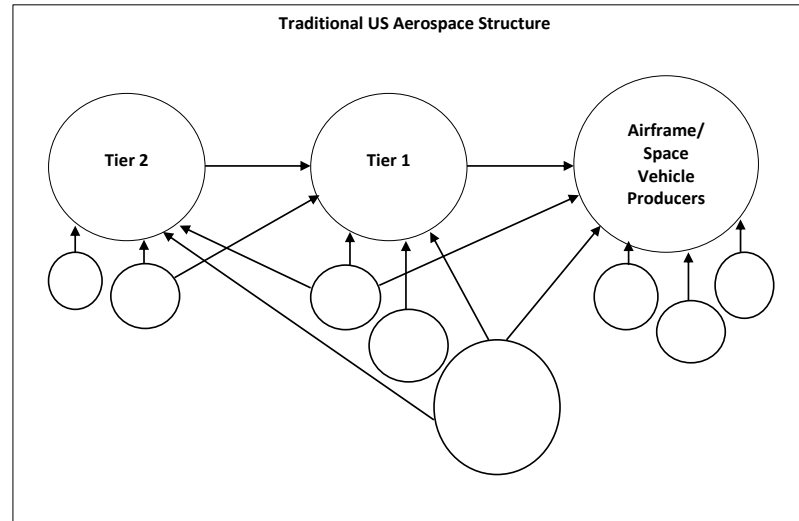
# US Aerospace Market Overview

Rank	Supplier	Value (\$ Millions)	% Total
1	France	12,493	21.4%
2	Canada	9,050	15.5%
3	Japan	7,051	12.1%
4	Germany	5,594	9.6%
5	United Kingdom	4,146	7.1%
<b>Sub Total Top 5</b>		38,334	65.7%
6	Brazil	2,766	4.74%
7	Mexico	2,572	4.41%
8	Italy	2,109	3.61%
9	Singapore	1,994	3.42%
10	China	1,224	2.10%
<b>Sub Total Top 10</b>		49,000	84.0%
11	Poland	1,157	1.98%
12	Korea	1,117	1.91%
13	Israel	987	1.69%
14	Turkey	554	0.95%
15	Sweden	517	0.89%
16	Australia	471	0.81%
17	Russia	458	0.78%
18	Belgium	429	0.73%
19	Switzerland	410	0.70%
20	Netherlands	376	0.64%
<b>Sub Total</b>		6,475	11.09%
<b>Total Aerospace Imports</b>		55,474	95.1%



# US Aerospace Market Overview

The US aerospace industry is expected to become less fragmented in the future with the vertical integration strategies being pursued by companies like Boeing, Northrop Grumman and Lockheed Martin.



# US Aerospace Market Overview



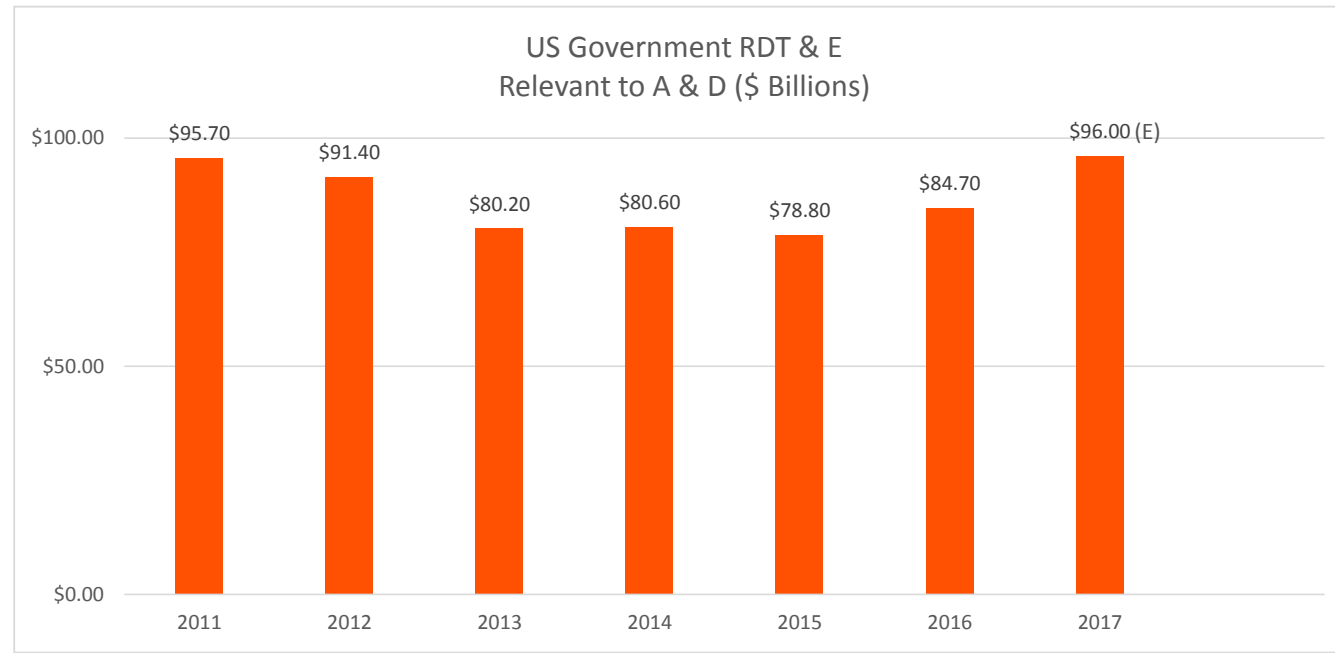
**The US aerospace industry is relatively geographically concentrated. Tier 2s and machine shops tend to follow the clusters formed by tier 1s and OEMs. (Based on AIA 2017 Revenues)**

1. Southern California and Arizona: Largest US production area for commercial, defense and space. Companies include Northrop Grumman, Lockheed Martin, General Atomics, Eaton, SpaceX, Honeywell and many others.
2. Texas, Arkansas, Alabama and Mississippi: Second largest production cluster primarily defense and space. Companies with HQs or major operations there include Lockheed Martin, Boeing and General Dynamics.
3. Washington/Oregon: Major production area for commercial aircraft, including Boeing, Precision CastParts, Crane Aerospace and others
4. New York, New Jersey, Massachusetts, Connecticut and Pennsylvania: UTC Pratt & Whitney, Sikorsky, Raytheon, Boeing and Northrop Grumman are the main players in this cluster.
5. North Carolina: Major commercial production area including Boeing and Airbus.
6. Washington, DC and Virginia: General Dynamics and SAIC are notable companies in this region.
7. Oklahoma and Kansas: Spirit Aerostructures, Piper and Cessna
8. Indiana and Missouri: Boeing Defense and Space
9. Illinois, Wisconsin and Minnesota: Honeywell, UTC, Raytheon and Boeing
10. Ohio: GE and Goodyear (Ohio area said to be gaining ground as companies move out of California to Ohio due to California's severe environmental restrictions)

# US Aerospace Market Overview



US government funding of A&D R&D declined since 2011 to a low of \$78.8 billion in 2015. It recovered somewhat to \$84.7 in 2016 and was estimated to reach 2011 levels in 2017, about \$96 billion.



Source: AIA, Cedar, PwC, Deloitte, Ernst & Young

# US Aerospace Market Overview



## **The US is becoming more stringent in its treatment of exports of sensitive military and aerospace technologies**

- The ITAR (International Traffic in Arms Regulations) and EAR (Export Administration Regulations) are regulations adopted by the US to safeguard sensitive technology and to limit the export of technologies that can be used as weapons/munitions
- ITAR (International Traffic in Arms Regulations) and dual use regulations are more sophisticated and more rigorously
- Italian companies are subject to ITAR and EAR if they import or export products on the USML and “everything else not controlled by ITAR” like commercial products, dual use products and information and technology

# US Aerospace Market Overview



**US respondents assumed any supplier would be certified for the current and revised aerospace quality standards, e.g., AS9100D, etc. and be subject to inspections/audits by US aerospace customers to participate in the US aerospace industry**

- Every supplier that provides products into flight critical subassemblies must be AS9100 certified and coatings companies must be NADCAP registered.
- Almost every Tier One and Tier Two interviewed was AS9100 and ITAR registered as almost all components are considered flight critical.
- Distributors who service aerospace have AS9120 certification.
- Contacts indicated it was a requirement to sell products into the aerospace industry.
- At a minimum, all companies were ISO registered.

**A critical aspect for all aerospace products is that they can be traced through the supply chain**

- A small Italian aerospace subcontractor may not have AS9100 certification, but the US buying company definitely will.
- The US supplier will certify that their Italian subcontractor conforms to AS9100, etc. and will take responsibility (and liability) for the component.

# US Aerospace Market Overview

Cedar analyzed the data from its US contacts. There were 125 contacted in total. There were 109 manufacturers out of this total.



## Contact Revenues

<\$100 Million	\$100-1,000 Million	>\$1,000 Million
55%	8%	36%

## Contact Credentials

ISO 9100	AS 9100	NADCAP	ITAR	Other (NASA, ATF, UL)
75%	85%	20%	53%	25%

## Contact Country Sources of Imports

Japan	Germany	Other EU	Switzerland	Italy	Asia/Other
82%	65%	20%	18%	36%	18%

## Contact Opinions of Import Growth

Negative Growth	Flat	1-10% CAGR	>10% CAGR
0	15%	53%	32%

# US Aerospace Market Overview

US Aerospace Manufacturing Revenue Forecast (\$Billions)							
	2017	2018	2019	2020	2021	2022	2017-2022 % CAGR
Commercial Aviation	\$394	\$407	\$417	\$426	\$437	\$449	2.6%
Defense (Ex-Marine)	191	200	206	212	222	228	3.6
Space	58	61	65	70	74	78	6.1
General Aviation	7	7	8	9	9	9	5.1
Total	\$650	\$675	\$696	\$717	\$742	\$764	3.3%

Source: Cedar, AIA, FAA

# US Aerospace Market Overview

Region	Commercial (Regional Jet, Commercial Transport)	Defense (Fighter, Transport, Rotary Wing, UAV)	General Aviation (Business Jet/Turboprop, Piston Engine)	Space (Satellite, Manned Flights)
North America	↓ to ○	↑↑	○	↑
Europe	○	↑	○ to ↓	○
Asia-Pacific	↑ to ↑↑	↑	○	↑
South America	↑	○	minor market	no market
Middle East	○	↑	↑	minor market
Africa	minor market	○ to ↑	minor market	no market
Other	minor market	minor market	minor market	no market

Key: ↑↑ = fast growth, >5% p.a.  
 ↑ = moderate growth, ≤5% p.a.  
 ○ = flat  
 ↓ = declining



# US Aerospace Market Overview



**A micro-view of US A&D trends is provided below:**

## **Commercial Aerospace**

- Declining unit order volume
- Revenue will grow as production increases
- Margins & Cash flow should improve

## **U.S. Defense**

- Uncertainty about the Trump administrations plans
- International sales
- Mergers & acquisitions
- Growing revenues

## **General Aviation**

- Flat market
- Fixed wing piston aircraft most vulnerable
- Commercial GA growing ahead of non-commercial GA

# US Aerospace Market Overview

Key Trends in the US Aerospace Industry		
Trend	Comments	Likely Impact on Italian Products
<b>Unmanned Air Vehicles</b>	<ul style="list-style-type: none"> <li>Drones for military surveillance and combat are already being used.</li> <li>New applications in commercial package delivery coming with FAA regulations.</li> </ul>	<ul style="list-style-type: none"> <li>Positive Impact for Italian machinery and component suppliers.</li> </ul>
<b>Additive Manufacturing</b>	<ul style="list-style-type: none"> <li>3D printing historically used on non-critical parts</li> <li>Now being used on critical complex parts.</li> </ul>	<ul style="list-style-type: none"> <li>Honeywell Aerospace is very positive about Beam IT, an Italian additive manufacturing technologies company.</li> <li>GE Aviation using 3D printed nozzles on its engines.</li> </ul>
<b>Continued Airline Passenger Growth</b>	<ul style="list-style-type: none"> <li>Boom time in airline orders may be over, but airframers filling niches e.g. 757 replacement for long thin routes.</li> <li>Passenger growth predicted to be 7% per year by Boeing.</li> </ul>	<ul style="list-style-type: none"> <li>Italian suppliers will benefit from commercial airframers orders, Airbus &amp; Boeing.</li> <li>Very niched in US aerospace due to restrictions, machinery only.</li> </ul>
<b>Increasing Defense Budgets</b>	<ul style="list-style-type: none"> <li>Trump budget has expanded US defense spending.</li> <li>All US companies, interviewed were at 100% capacity, especially machine shops.</li> </ul>	<ul style="list-style-type: none"> <li>Italian part suppliers restricted in defense jobs.</li> <li>Machinery suppliers are less subject to ITAR, etc.</li> </ul>
<b>More Favorable Corporate Taxes/ Threat of China Trade War</b>	<ul style="list-style-type: none"> <li>Rising wages in US aerospace.</li> <li>Rising employment in US aerospace.</li> <li>Tariffs in Asia a possibility.</li> <li>Large A&amp;D firms making money.</li> </ul>	<ul style="list-style-type: none"> <li>Italian companies could benefit if tariffs are placed on Chinese machinery and Japanese aerospace components.</li> </ul>
<b>Space/Market Growth</b>	<ul style="list-style-type: none"> <li>NASA and DoD space programs are now better funded and active.</li> <li>New small satellites being launched. New anti-satellite technologies (swarms).</li> <li>Potential for commercial space travel.</li> </ul>	<ul style="list-style-type: none"> <li>Italian suppliers of rocket components and satellites will benefit.</li> </ul>

# Positioning of Italian Suppliers

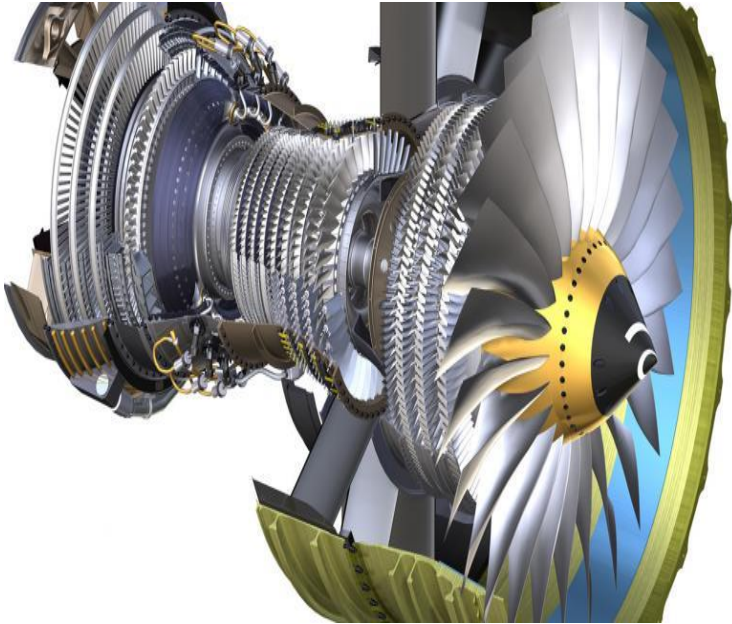


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**The US ITA reported in 2017 a 3-4% share for Italian imports into the US.**

- The main imports were reciprocating engines, turbine engines, engine components, navigation instrumentation and hydraulic components (see Appendix 4: Import Customs Codes and Country of Origin)
- Other imports from Italy to the US aerospace industry also included non-engine precision machined components, booster rocket motors, machine tools, injection molding machines, parachutes, UAV launch and arrester systems and others.
- Italian machine tool companies have been popular in applications for highly engineered complex aerospace parts.

# Positioning of Italian Suppliers



**On the basis of the performed analysis, we can summarize the following main trends in the different aerospace segments:**

- Italian suppliers considered to be very high quality in both components and machinery.
- Italian suppliers have world class technology.
- Italian suppliers' products are considered to be unique.
- Italian suppliers' machinery is considered to be "one of a kind" and easy to use.

**US respondents' negatives are clustered on two aspects of how Italian companies do business.**

- Summer shutdowns
- Limited US distribution

# Positioning of Italian Suppliers

	POSITIVES	NEGATIVES
Reciprocating Engines	High Quality	Dependent on General Aviation
Turbine Engines	High Precision	GE Dependent
Engine Components	High Quality	Distance/Time Zones
Navigation Instruments	World Class	Summer Shutdowns
Hydraulic Components	High Precision	Tariff Impacts
Booster Rockets	High Quality and Reliability	Design/Schedule Changes
Flight Training Systems	Established Training Aircraft	Non-US
UAV Launch/Recovery Gear	Ease of Use	Higher Cost
CNC Machine Tools	World Class	Limited US Distribution
3D Printing	Exotic Materials	Limited US Distribution
Rubber Injection Molding	World Class	High Prices
Other Machinery (EDM, EBM, etc.)	Unique	Summer Shutdowns

# Conclusions



**The US aerospace market is very large, but growth is expected to follow US GDP over the next 5 years.**

- The major growth areas will be small satellites, commercial space, electric/hybrid power and UAVs in both military and commercial sectors.

**The US aerospace industry is expected to become more concentrated as large OEMs and tier 1s pursue vertical integration strategies.**

- While this trend appears not to favor Italian suppliers, it must be noted that there will be fewer remaining aerospace suppliers who will need sources of aerospace products and aerospace-compatible machinery.
- These are two areas where Italian suppliers have advantages.

**A major conclusion of this program is that Italian parts manufacturers and machinery suppliers are held in high regard by most US A&D companies.**