2019 Aerospace manufacturing attractiveness rankings

Geographic assessment for aerospace manufacturing investments

pwc

Introduction

The global Aerospace and Defense (A&D) industry reported record operating profit of $81 billion in 2018, a 9% increase over the prior year. The top 100 A&D companies (by revenue) also recorded $760 billion in revenue, an increase of 9% over 2017. Industry operating margin improved 10 basis points to 10.7%.[1]

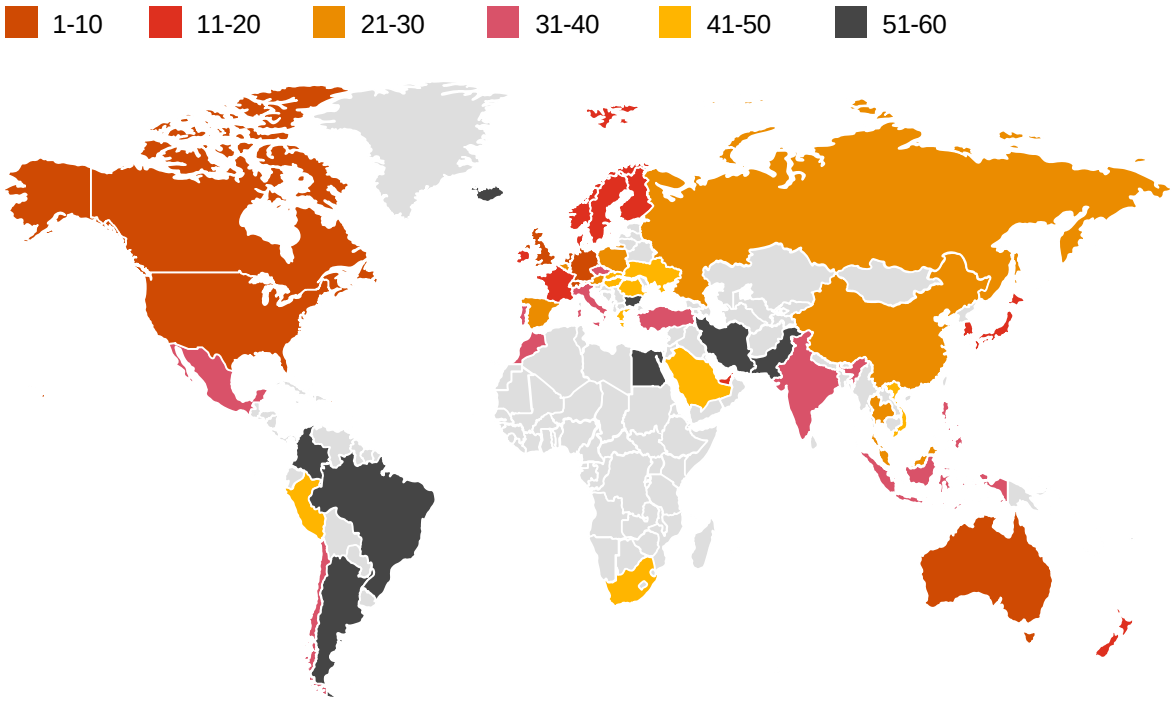
The global A&D industry is expected to show continued growth this year, primarily driven by more defense spending in the US and Europe and projected increases in aircraft deliveries. Industry growth is also being bolstered by merger and acquisition activity as well as lower corporate tax rates in the US (which are not reflected in the 2018 data). Commercial revenue passenger miles grew 6.5% in 2018, about twice global GDP growth and the fifth consecutive year above 6%. New aircraft deliveries increased 8%, and the industry set a new record of 1,606 large aircraft deliveries. It was also the ninth consecutive year of profitability for the US airline industry. [2]

The 2019 index is based on a weighted score of category and subcategory rankings. Ranking categories include cost, economy, geopolitical risk, infrastructure, labor, industry, and tax policy. The geopolitical risk category has been excluded from the state rankings as the risk is similar for all the states. The categories are comprised of many discrete metrics, which are then aggregated and weighted to arrive at the final rankings. While both state and country rankings use comparable metrics, there are slight differences in each measure's relevance to the ranking and the availability of quantitative information. Further details on the methodology can be found in the Appendices.

This report, our sixth edition of annual aerospace manufacturing attractiveness rankings by countries (or regions) and states in the US, can be a helpful tool in planning for future growth, enhancing manufacturing supply chains, and reexamining costs. We hope you find it informative and useful. We welcome your feedback on the report and how it might impact your strategic plans.

[1] Aerospace and defense year in review 2018 and forecast, *PwC*, May 2019.
[2] FAA Aerospace Forecast, Fiscal Years 2018-2038.

Country rankings



Top 10 country/region rankings for aerospace attractiveness

Country/region	Overall Rank	Cost	Labor	Infra-structure	Industry	Geo-political Risk	Economy	Tax Policy
United States	1	2	2	5	1	3	8	37
Canada	2	10	6	15	6	4	28	19
Singapore	3	23	8	20	3	12	4	8
United Kingdom	4	9	5	6	8	14	22	23
Australia	5	1	28	13	19	6	14	26
Switzerland	6	3	18	12	26	16	5	20
Germany	7	34	7	3	7	1	35	43
Netherlands	8	24	14	4	36	10	12	21
Hong Kong	9	26	15	19	28	17	9	1
South Korea	10	25	43	2	20	7	10	24

Below is a closer look at the top five countries in our ranking:

United States

The US remains the global A&D industry leader, with $244 billion in sales last year. The country's dominant industry size is supported by its GDP of $19.5 trillion and strong domestic transportation infrastructure. The US was the global leader in A&D exports in 2018, generating $132 billion in revenue. The country's top ranking was also strengthened by a growth in international and domestic passenger traffic.

Canada

Canada is ranked second in the global A&D industry attractiveness study, supported by an educated labor force, low level of geopolitical risk, and industry size. In 2018, industry revenue increased 7% from the prior year to reach $18.1 billion. In July 2017, Canada launched the Strategic Innovation Fund with a budget of $1.26 billion over five years, which encourages R&D efforts to facilitate the growth and expansion of A&D firms in the country and attract and retain large scale investments.

Singapore

With a stable government, strong manufacturing base, and favorable tax policy, Singapore maintains its third position in the rankings. The country is ranked first in the quality of electricity supply and has a healthy GDP year-on-year growth rate of 3.14%. Singapore is Asia's leading solutions provider for aircraft maintenance, repair and overhaul (MRO) needs, contributing 10% to global MRO output.[3] This year, local aerospace companies, along with government agencies and several other interested parties, agreed to collaborate on 3D technology that will allow components to be produced in a single piece, accelerating product development and reducing manufacturing costs.[4]

United Kingdom

With revenues of $46 billion, the UK has a strong A&D industry. However, most of its aerospace production is exported, which may be adversely affected by Britain's exit from the European Union. Uncertainty over Brexit terms and the potential disruption to the country's global supply chains has led to speculation that the industry may have more difficulty attracting global investment going forward, jeopardizing its production timetables.[5] However, despite a looming Brexit, the UK Defense Minister announced in July that the government is investing £2 billion through 2025 in a next generation fighter jet, the "Tempest," and that Britain would seek international partners to provide additional funding.

In December 2018, a new initiative was launched in which the government agreed to commit up to £125 million as part of the Future Flight challenge, which is focused on developing new technologies, including drones and urban air vehicles. The industry is expected to more than match this investment.[6]

Australia

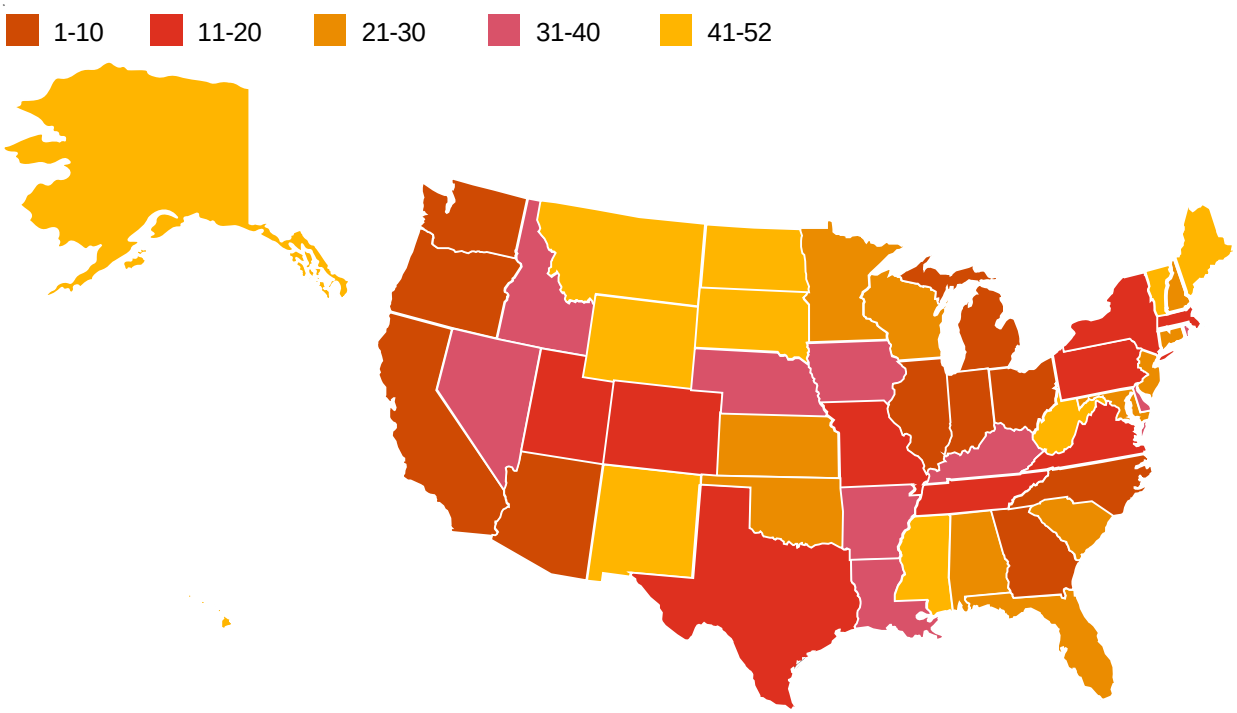
Australia's ranking is supported by its low costs and relatively low level of geopolitical risk. In 2018, Australia released a long-term vision, "the Defence Industrial Capability Plan," to increase the competitiveness of its defense industry. As part of this plan, the government will increase defense spending over the next decade, earmarking more than $200 billion for new investment in defense capabilities. In April of this year, Australia unveiled a full-size model of a new unmanned jet fighter, the first one the country has developed since World War II.

[3] No.1 in Asia for MRO," *EDB Singapore*.
[4] "Aerospace sector pushes for 3D technology," *Straits Times*, Sept. 22, 2018.
[5] Christopher DeNicolo, David Matthews and William Buck, "Industry Top Trends 2019: Aerospace & Defense," *S&P Global Ratings*, Nov.14, 2018.
[6] "Industrial Strategy – Aerospace Sector Deal," *Gov.UK*, Department for Business, Energy & Industrial Strategy, Dec. 6, 2018.

Considerations for your business

Passenger growth continues to increase as does global defense spending. The current backlog of aircraft orders will take about 6-8 years to clear even with companies hitting record production levels. The US A&D industry performed especially well in 2018, with exports totaling $151 billion, an increase of 5.8% from the previous year, accounting for 9% of US exports and yielding a $90 billion trade surplus. Although manufacturers have not been immediately hurt by tariffs, they may need to rethink their supply chains longer-term, especially those in the Asia-Pacific region. The trade situation continues to evolve rapidly, and companies should have a plan to deal with the potential ramifications of trade wars with various countries and areas around the world. Some companies may consider reshoring all or part of their supply chain as business conditions merit.

State rankings



Top 10 State rankings for aerospace attractiveness

State	Overall Rank	Cost	Labor	Infra-structure	Industry	Economy	Tax Policy
Washington	1	35	11	1	1	5	26
Georgia	2	8	20	15	7	10	5
California	3	49	13	3	2	2	22
Michigan	4	23	28	23	14	3	1
Illinois	5	40	12	4	11	4	31
Indiana	6	18	41	11	10	7	2
North Carolina	7	19	24	38	6	9	4
Ohio	8	32	35	8	4	8	8
Arizona	9	14	25	17	5	21	9
Oregon	10	24	17	14	19	18	13

Below is a closer look at a few notable industry initiatives or other indications of significant growth among the five most highly ranked States:

Washington

Washington remains in first place this year, with favorable rankings in the categories of industry, infrastructure, and economy. With a total workforce of over 136,000, the state produced 1,400 aircraft and unmanned aerial systems in 2018. It also manufactured nearly 90% (741) of all commercial aircraft in the US. In order to promote innovation, the state offers favorable tax policies, such as tax credits for pre-production development expenditures, and support for several public-private partnerships. The state is host to major players, such as Blue Origin and Boeing Commercial Airplanes (BCA) as well as home-grown companies, including Spaceflight Industries and Planetary Resources. Boeing is not only the largest private employer in the state, but also the world's largest aircraft manufacturer. The company set an industry record in 2018 for delivering 806 commercial airplanes and registering revenues of $101 billion.[7]

Georgia

Georgia is home to one of the world's most traveled airports, eight regional airports, expanding military bases, and accessibility to the country's fastest growing major port. It is home to more than 800 major aerospace companies, including Lockheed Martin, Gulfstream Aerospace, and Meggitt Polymers & Composites. Companies are attracted to the state's relatively low costs (notably, electricity and hourly wages) and a corporate tax rate of 5.7%. Georgia's universities and colleges spend more than $2 billion annually in R&D. In October 2018, Airbus collaborated with the Georgia Institute of Technology to open a new center for overall aircraft design activities.

California

California is third in our ranking, mainly due to a strong economy, good infrastructure, and a strong industry presence. The size of its aerospace industry, approximately 850 companies, is second only to Washington State. California is also home to three NASA research centers and the Mojave Air and Space Port, which includes more than 60 companies engaged in aerospace design, flight testing, and research.

Southern California, with its balmy climate and robust technology sector, is growing as a hub for space-related ventures, including SpaceX, Rocket Lab, and a host of small and medium-sized startups.

Michigan

Michigan has a favorable corporate tax structure, with a flat rate of 6%, and a healthy economy. It is also trying to grow its aerospace industry with support from the Aerospace Industry Association of Michigan, which represents about 800 companies, including major global players. Michigan is home to over 18 educational institutions with aerospace and aviation-related degrees and curriculum, providing the state with a pipeline of skilled workers. Also, aerospace companies are taking advantage of the skilled automotive workforce and the large manufacturing base in the state. In the past 18 months, the state has attracted nearly $750 million in aerospace capital investment. Michigan is targeting space-related ventures, ranging from advanced research to space port site analysis for launching low- earth orbit satellites.

Illinois

Illinois's A&D industry is supported by the state's strong economy and infrastructure. The state's GSP grew 2.3% in 2018 compared to 2017, and its total manufacturing output grew 300 basis points to $103.75 billion in the same period. Illinois is home to prime contractors and subcontractors that supply systems and components to the US military, NASA, and aerospace manufacturers. In April 2019, Collins Aerospace, a company that provides avionics and information technology systems and services, unveiled plans to launch a high-power, high-voltage $50 million facility to design and test systems for the next generation of electric aircraft. This facility is part of a larger $150 million investment that Collins Aerospace expects to make in electric systems over the next three years and builds on the $3 billion it has spent on advancing its electric architectures over the past decade.[8] In November 2018, the Army Research Laboratory established the Center for UAS Propulsion (CUP) at the University of Illinois to focus on unmanned aircraft systems technologies.

[7] "Boeing hires more than 8,500 new Washington employees in 2018," *Boeing*, Jan. 31, 2019.

[8] "Collins Aerospace unveils plans to redefine the future of electric flight," *Market Watch*, Apr. 4, 2019.

Notable events in other States

New Hampshire

In October 2018, BAE Systems, a leading UK-based aerospace company, announced plans to construct a 220,000 sq. ft. facility in Manchester that could employ as many as 400 workers. The company is already the state's largest manufacturing employer, with over 5,700 workers. In February 2019, GE Aviation won a $517 million contract to build engines for the US Army's next generation Black Hawk helicopters. As a result, GE's Hooksett plant, which employs more than 1,000 workers, indicated it is planning to add 75 more employees.[9]

Florida

In 2018, Lockheed Martin was awarded a nearly $400 million contract to produce hundreds of air-to-surface missiles for the Air Force. The work, expected to be completed by 2021, will be done at the company's Orlando facility, which employs about a 1000 people. Early in 2019, Lockheed announced it was opening a new R&D facility in Orlando and that it would add more jobs in the state. Also, RUAG, a Swiss aerospace firm, said it would be increasing investment in Florida (and two other states) to meet anticipated demand from US space ventures.[10] In October, Blue Origin announced it would construct a new $60 million facility near Cape Canaveral to test and refurbish rockets. SpaceX released plans to build several new facilities at the Kennedy Space Center.

Considerations for your business

The domestic A&D industry is growing along with the overall economy and current unemployment rates are low. As a result, there is increased competition for talent, and A&D companies are under pressure to attract people to their industry. While companies have been creating more outreach programs to broaden the talent pool and include more diverse populations, there is still room for improvement. The industry should increase its appeal to young people to help establish a pipeline of future talent. One program that is helping companies identify promising talent early and guide their career choices is the FIRST Robotics Competition (FRC) for high school students. The aim of the international competition, entering its thirtieth year, is to inspire students to follow science and technology careers. FRC has become so successful that it has spawned similar type programs for elementary and middle school students. Companies can engage with the program in several ways, from funding teams to providing mentors and equipment. It is an opportunity for A&D companies to work closely with students and introduce them to the opportunities the industry has to offer.

[9] Liisa Rajala, "Growth in international aerospace market fuels increased production in NH," *NH Business Review,* Aug. 8, 2018

[10] Sandra Erwin, "As space business grows, Ruag ramps up U.S. manufacturing," *Titusville Area Chamber of Commerce*, April 19, 2018.

Appendices

Ranking methodology

Ranking calculations

The 2019 country/region and US state rankings were determined through the combination of seven category ranks. The category ranks were all weighted equally, although the measures used to determine category ranks were weighted to account for relevance and the availability of quantitative information. Weight measures were determined through a collaboration between client service professionals and the industry analyst at PwC and can be found in the "Measure Weights for Country and State Rankings" section. Measures with null values were given the lowest possible rank. The formulas below were used to compute ranking calculations:

Provided:

$$\frac{Measure\ value}{Measure\ Weight}$$

Calculations:

$$Rank_{Measure\ i} = Rank\ [Measure\ value]$$

$$Score_{Measure\ i} = Weight_{Measure\ i}\ x\ Rank_{measure\ i}$$

$$Rank_{Category\ n} = Rank\ [Score_{Measure\ 1} + Score_{Measure\ 2} + \ldots + Score_{Measure\ i}]$$

$$Final\ country\ rank = Rank\ [Final\ country\ score]$$

Data resources

Seven public and private independent data sources were used in calculating the 2019 country/region rankings. Paid-for subscriptions included IHS and S&P and public domain information was obtained from global associations such as Germanwatch and the World Economic Forum. PwC's "Paying Taxes 2019" report provided thorough data for the Tax Policy category.

Methodology changes

The country rankings combined a total of 32 metrics and the state rankings were based on a total of 30 metrics this year. The use of such a diverse dataset increases ranking validity.

Measure selection

The measures used in the 2019 Aerospace Manufacturing Attractiveness Rankings came from "Facility Location Selection for Global Manufacturing."[11] In cases where we were unable to obtain detailed data for certain metrics, we used proxy data. The following illustrations show the breakouts of country and US state rankings.

Measures used in country/region rankings

Labor	Infrastructure	Industry	Geopolitical risk	Economy	Cost	Tax Policy
Labor Force Total country labor force	**Quality of Roads** Quality of Roads	**Market Size** Total aircraft and spacecraft sales	**Population** Average annual population	**GDP** Real gross domestic product (GDP)	**Operating Expenses** Aerospace operating expenditure as a % of sales	**Tax Ranking** Based on the overall ranking in PwC's "Paying Taxes" publication
Basic Education Pupil-to teacher ratio in primary education	**Quality of Railroads** Railroads	**Market Profit Margin** Aircraft& spacecraft net profit over sales	**Population Growth** Annual population growth	**GDP Growth** Real GDP growth	**Trend in Capex** Annual changes in aerospace capital expenditure	
Skilled Education Skillset of Graduates	**Quality of Port Infrastructure** Efficiency of seaport services	**Market Maturity** Total aircraft and spacecraft consumption	**Strategic Risk** Overall strategic risk rating	**FDI** New Foreign Direct Investment (FDI), net capital inflow	**Labor Cost** Unit labor costs index	
Advanced Education Ease of finding skilled employees	**Quality of Air Infrastructure** Airport connectivity		**Political Risk** Overall political risk rating	**Interest Rate** Interest rate policy	**Electricity Prices** Electricity price for industrial user	
Union Flexibility Cooperation of labor-employer relations	**Internet usage** Internet users		**Sovereign Risk** Credit Risk Rating	**Debt** Current account balance as a% of GDP	**Labor Productivity** GDP-to-employed labor force	
	Quality of Electricity Supply Electricity infrastructure		**Climate Risk** Climate risk index	**Unemployment Rate** Annual average unemployment rate		

[11] A.H. Kalantari, "Facility Location Selection for Global Manufacturing," UWM Digital Commons at the University of Wisconsin Milwaukee, August 2013.

Measures used in state rankings

Labor	Infrastructure	Industry	Econimy	Cost	Tax Policy
Labor Force Production workers annual hours for aerospace manufacturing	**Quality of Roads** Road condition by average roughness	**Industry Size** Total value of aerospace shipments & receipts	**GSP** Real gross state product (GSP)	**Energy Cost** Average price of electricity to Ultimate consumer	**Corporate Income Tax** Corporate income tax burden
Basic Education % of people over 25 who have completed high school	**Quality of Railroads** Number of freight railroads byclass	**Industry Profit Margin** Total value added in aerospace products and parts mfg.	**GSP Growth** Real GSP growth	**Transportation Cost** Transportation expenditure by State & Local Govt.	**Individual Income Tax** Individual income tax rate
Skilled Education % of people over 25 who have completed a bachelor's degree	**Quality of Air Infrastructure** Public and private airports, helicopters, and seaplane bases	**Industry Maturity** Manufacturing share of total gross share product	**CPI** Consumer price index	**Labor Cost** Average hourly Wage, manufactunng	
Advanced Education % of people over 25 who have completed a advanced degree	**Internet usage** % of household with a broadband internet subscription	**Industry Growth** Growth in manufactured goods exports	**Exports** Manufactured goods exports	**Labor Productivity** Industrial production index for total manufacturing	
Union Flexibility Union membership rates by state	**Quality of Electricity Supply** Number of major disturbances and unusual occurrences	**Number of Companies** Total number of companies in the industry	**Manufacturing Output** Total manufacturing output	**Construction Cost** Total cost over created value of construction	
		Number of Supplier Total number of manufacturing firms	**Government Subsidies** Subsidies for durable goods manufactured		
		Labor Cost Total annual payroll in aerospace manufacturing			

Category weights and reference metrics

Country/region metrics

Category	Sub-Category	Reference Metric	Source	Weight	Category Sum
Cost	Opex/Sales	(Aircraft & Spacecraft - Operating Expenditures)/(Aircraft & Spacecraft - Sales)	IHS Aircraft & Spacecraft Industry Outlook January 2019	12%	100%
	Trend in Capex	Aircraft & Spacecraft - Capital Expenditures Percent Change	IHS Aircraft & Spacecraft Industry Outlook January 2019	6%	
	Labor Cost	Index: Unit Labor Costs, US$ basis	IHS Global Economics January 25, 2019	12%	
	Electricity Prices	Electricity Price, Industrial Users, USD/KWh	BMI 2019	30%	
	Labor Productivity	Labor Productivity: GDP-to-Employed Labor Force, US$	IHS Global Economics January 25, 2019	40%	
Labor	Labor Force	Labor Force	IHS Global Economics February 15, 2018	18%	100%
	Basic Education	Pupil-to-teacher ratio in primary education (Ratio)	WEF Global Competitiveness Index 2018	25%	
	Skilled Education	Skillset of Graduates 1-7 (best)	WEF Global Competitiveness Index 2018	18%	
	Advanced Education	Ease of finding skilled employees 1-7 (best)	WEF Global Competitiveness Index 2018	25%	
	Union Flexibility	Sum of Cooperation in labor-employer relations, 1-7 (best)	WEF Global Competitiveness Index 2018	14%	
Infrastructure	Quality of Roads	Sum of Quality of roads, 1-7 (best)	WEF Global Competitiveness Index 2018	15%	100%
	Quality of Railroads	Railroads 0-100 (best)	WEF Global Competitiveness Index 2018	10%	
	Quality of Port Infrastructure	Efficiency of seaport services 1-7 (best)	WEF Global Competitiveness Index 2018	15%	
	Quality of Air Infrastructure	Airport connectivity	WEF Global Competitiveness Index 2018	30%	
	Internet Usage	Internet users (% of population)	WEF Global Competitiveness Index 2018	15%	
	Quality of Electricity Supply	Electricity infrastructure 0-100 (best)	WEF Global Competitiveness Index 2018	15%	
Industry	Industry Size	Aircraft & Spacecraft - Sales	IHS Aircraft & Spacecraft Industry Outlook January 2019	50%	100%
	Industry Profit Margin	(Aircraft & Spacecraft - Net Profits)/(Aircraft & Spacecraft - Sales)	IHS Aircraft & Spacecraft Industry Outlook January 2019	25%	

Category	Sub-Category	Reference Metric	Source	Weight	Category Sum
Industry	Industry Maturity	Aircraft & Spacecraft - Consumption	IHS Aircraft & Spacecraft Industry Outlook January 2019	25%	
Geopolitical Risk	Population	Population: Total	IHS Global Economics January 25, 2019	40%	100%
	Population Growth	Population: Growth Rate	IHS Global Economics January 25, 2019	5%	
	Strategic Risk	Overall Strategic Risk	IHS Country Risk Ratings January 28, 2019	20%	
	Political Risk	Overall Political Risk	IHS Country Risk Ratings January 28, 2019	20%	
	Sovereign Risk	Credit Risk Rating	S&P Capital IQ December 31, 2018	10%	
	Climate Risk	Climate Risk Index	Germanwatch Climate Risk Index 2019	5%	
Economy	Outside Investment	BOP Direct Investment Balance or Net FDI (Net Capital Inflow), % of GDP	IHS Global Economics January 25, 2019	5%	100%
	Interest Rates	Interest Rate: Policy	IHS Global Economics January 25, 2019	6%	
	Debt/GDP	Current Account Balance as a % of GDP	IHS Global Economics January 25, 2019	5%	
	Unemployment Rate	Unemployment Rate	IHS Global Economics January 25, 2019	35%	
	GDP	Real GDP (Gross Domestic Product), US$	IHS Global Economics January 25, 2019	40%	
	GDP Growth	Real GDP, Growth Rate, Year-on-Year	IHS Global Economics January 25, 2019	9%	
Tax Policy	Overall Tax Ranking	Overall Tax Ranking	PwC Paying Taxes 2019	100%	100%

State metrics

Category	Sub-Category	Reference Metric	Source	Weight	Category Sum
Cost	Energy Cost	Average Price of Electricity to Ultimate Customers by End-Use Sector, Industrial	EIA Electric Power Monthly (September 2018 and 2017 YTD Data)	25%	100%
	Transportation Cost	Transportation Expenditures by State and Local Governments, Total	DOT BTS State Transportation Statistics	15%	
	Labor Cost	Average Hourly Wage, Manufacturing	US Census Bureau - American Fact Finder	20%	
	Labor Productivity	Industrial Production Index, Total Manufacturing	IHS US Regional Economics 2019	25%	
	Construction Cost	NAICS 023 Construction - Total Costs/Total Value Created	US Census Bureau - American Fact Finder	15%	
Labor	Labor Force	Aerospace product and parts manufacturing - Production Workers Annual Hours	US Census Bureau - American Fact Finder	10%	100%
	Basic Education	Percent of people 25 years and over who have completed high school (includes equivalency)	US Census Bureau - American Fact Finder	5%	
	Skilled Education	Percent of people 25 years and over who have completed a bachelor's degree	US Census Bureau - American Fact Finder	40%	
	Advanced Education	Percent of people 25 years and over who have completed an advanced degree	US Census Bureau - American Fact Finder	40%	
	Union Flexibility	Union Membership Rates by State	Bureau of Labor Statistics	5%	
Infrastructure	Quality of Roads	Table 1-4: Road Condition	DOT BTS State Transportation Statistics	20%	100%
	Quality of Railroads	Table 1-13: Number of Freight Railroads by Class	Association of American Railroads	20%	
	Quality of Air Infrastructure	Table 1-10: Public and Private Airports, Heliports and Seaplane Bases	DOT BTS State Transportation Statistics	20%	
	Internet Usage	Percent of Households with a Broadband Internet Subscription	US Census Bureau - American Fact Finder	20%	
	Quality of Electricity Supply	Major Disturbances and Unusual Occurrences	DOE Office of Electricity Delivery & Energy Reliability	20%	

Category	Sub-Category	Reference Metric	Source	Weight	Category Sum
Industry	Industry Size	Aerospace product and parts manufacturing - Total value of shipments and receipts for services	US Census Bureau - American Fact Finder	20%	100%
	Industry Profit Margin	Aerospace product and parts manufacturing - Value added	US Census Bureau - American Fact Finder	5%	
	Industry Maturity	Mfg share of total GSP	NAM Manufacturing Data Table (2018)	5%	
	Industry Growth	Growth in Manufactured Goods Exports	NAM Manufacturing Data Table (2018)	20%	
	Number of Companies	Aerospace and Defense Firms	Capital IQ Company Screening Report	20%	
	Labor Cost	Aerospace product and parts manufacturing - Annual Payroll	US Census Bureau - American Fact Finder	10%	
	Number of Suppliers	Manufacturing Firms	NAM Manufacturing Data Table (2018)	20%	
Economy	GDP	Real Gross State Product (GSP)	IHS US Regional Economics 2019	10%	100%
	GDP Growth	Real GSP Growth	IHS US Regional Economics 2019	20%	
	Consumer Price Index	Consumer Price Index (CPI)	IHS US Regional Economics 2019	5%	
	Manufacturing Output	Total Manufacturing Output	IHS US Regional Economics 2019	30%	
	Exports	Manufactured Goods Exports	NAM Manufacturing Data Table (2016)	30%	
	Subsidies	Subsidies, Durable Goods Manufacturing	BEA - Regional Data 2018	5%	
Tax Policy	Corporate Income Tax Burdens	Corporate Income Tax Burdens	COST, STIRI, Ernst & Young LLP "FY17 Total state and local business taxes"	75%	100%
	Individual Income Tax	Individual Income Tax Rate	COST, STIRI, Ernst & Young LLP "FY17 Total state and local business taxes"	25%	

Complete country/region rankings

Country/region	Overall Rank	Cost	Labor	Infra-structure	Industry	Geo-political Risk	Economy	Tax Policy
United States	**1**	2	2	5	1	3	8	37
Canada	**2**	10	6	15	6	4	28	19
Singapore	**3**	23	8	20	3	12	4	8
United Kingdom	**4**	9	5	6	8	14	22	23
Australia	**5**	1	28	13	19	6	14	26
Switzerland	**6**	3	18	12	26	16	5	20
Germany	**7**	34	7	3	7	1	35	43
Netherlands	**8**	24	14	4	36	10	12	21
Hong Kong	**9**	26	15	19	28	17	9	1
South Korea	**10**	25	43	2	20	7	10	24
United Arab Emirates	**11**	13	3	27	33	25	30	2
Sweden	**12**	21	13	10	18	13	32	27
Ireland	**13**	18	23	23	29	37	19	4
France	**14**	12	26	8	4	5	39	55
Denmark	**15**	5	33	7	59	18	33	9
Finland	**16**	8	16	11	35	20	57	11
Japan	**17**	36	11	1	13	2	7	97
New Zealand	**18**	14	37	25	31	26	40	10
Taiwan	**19**	37	29	29	32	9	16	29
Spain	**20**	15	46	9	2	23	48	34
Norway	**21**	4	32	22	44	22	27	30
Malaysia	**22**	38	10	16	11	11	13	72
Qatar	**23**	19	35	33	46	69	31	2
Belgium	**24**	6	44	14	23	28	52	60
Israel	**25**	7	21	17	29	40	17	90
China	**26**	45	20	26	10	15	1	114
Austria	**27**	11	40	18	55	27	49	40
Poland	**28**	20	91	34	21	21	2	69
Russia	**29**	39	39	42	5	46	29	53
Thailand	**30**	41	47	37	37	24	3	59
Portugal	**31**	31	38	23	48	36	46	39
Czech Republic	**32**	29	57	44	43	33	21	45
Morocco	**33**	28	75	49	24	32	60	25
Chile	**34**	40	24	28	47	28	36	76
Mexico	**35**	32	25	39	9	39	15	116
Indonesia	**36**	49	17	50	41	19	11	112
India	**37**	55	4	43	24	38	18	121
Italy	**38**	30	60	21	12	30	55	118

Country/region	Overall Rank	Cost	Labor	Infra-structure	Industry	Geo-political Risk	Economy	Tax Policy
Philippines	**39**	54	1	71	58	31	20	94
South Africa	**40**	47	53	53	38	44	76	46
Turkey	**41**	33	84	35	16	61	50	80
Romania	**42**	35	106	67	40	54	24	49
Greece	**43**	17	78	32	45	66	62	65
Hungary	**44**	42	119	51	49	35	23	86
Saudi Arabia	**45**	27	49	31	69	84	34	78
Ukraine	**46**	56	58	70	13	103	64	54
Slovakia	**47**	16	140	62	67	53	43	48
Vietnam	**48**	43	136	55	61	8	6	131
Costa Rica	**49**	53	42	96	53	100	63	57
Peru	**50**	44	89	81	62	47	38	120
Argentina	**51**	22	70	63	54	41	53	169
Colombia	**52**	57	27	68	64	43	47	146
Brazil	**53**	46	87	61	17	34	44	184
Sri Lanka	**54**	62	36	57	50	68	51	141
Bulgaria	**55**	48	108	59	66	80	70	92
Pakistan	**56**	63	22	74	27	64	26	173
Iran	**57**	50	59	65	38	109	65	149
Egypt	**58**	60	83	54	65	48	42	159
Bahrain	**59**	86	85	40	55	106	121	5
Iceland	**60**	59	45	41	76	58	56	33
Kuwait	**61**	84	132	73	21	94	102	7
Oman	**62**	116	71	47	51	56	123	12
Nigeria	**63**	58	56	104	34	67	54	157
Bangladesh	**64**	80	51	90	15	88	25	151
Panama	**65**	52	87	55	68	73	59	174
Uruguay	**66**	61	103	78	72	45	83	101
Luxembourg	**67**	68	68	30	76	71	68	22
Kazakhstan	**68**	66	67	64	76	42	37	56
Ecuador	**69**	73	48	85	42	119	61	143
Ghana	**70**	82	12	97	51	51	104	115
Slovenia	**71**	72	63	48	76	76	45	41
Estonia	**72**	75	90	38	76	63	77	14
Lithuania	**73**	77	110	45	76	55	73	18
Azerbaijan	**74**	104	30	46	76	93	66	28
Latvia	**75**	76	99	51	76	87	79	13
Tunisia	**76**	78	93	79	63	75	88	133
Kenya	**77**	117	62	84	60	52	98	91
Cyprus	**78**	70	52	58	76	90	78	47

Country/region	Overall Rank	Cost	Labor	Infra-structure	Industry	Geo-political Risk	Economy	Tax Policy
Mauritius	**79**	87	61	82	76	78	84	6
Serbia	**80**	65	77	75	76	81	80	79
Malta	**81**	71	81	76	76	99	71	71
Venezuela	**82**	51	66	110	73	143	75	189
Croatia	**83**	74	127	36	76	72	67	89
Georgia	**84**	108	126	66	76	126	86	16
Jordan	**85**	118	94	60	70	101	120	95
Algeria	**86**	64	79	83	76	77	74	156
Honduras	**87**	79	92	107	57	153	115	164
Zambia	**88**	101	73	127	76	60	122	17
Botswana	**89**	96	116	108	76	86	85	51
Moldova	**90**	110	113	94	76	181	82	35
Cameroon	**91**	93	31	116	75	74	108	182
Senegal	**92**	118	19	100	74	49	117	171
Montenegro	**93**	95	50	80	76	149	110	68
Guatemala	**94**	88	34	103	76	97	103	102
El Salvador	**95**	69	129	102	76	108	130	62
Albania	**96**	105	55	77	76	146	87	122
Cape Verde	**97**	109	80	109	76	122	94	77
Macedonia	**98**	98	137	112	76	150	93	31
Jamaica	**99**	100	41	93	76	151	89	123
Uganda	**100**	101	82	113	76	83	113	87
Namibia	**101**	91	114	88	76	79	142	81
Rwanda	**102**	121	69	120	76	50	149	35
Tajikistan	**103**	113	54	106	76	163	72	136
Ethiopia	**104**	89	115	101	76	62	95	130
Armenia	**105**	106	101	86	76	164	125	82
Mongolia	**106**	121	105	105	76	95	133	61
Seychelles	**107**	121	112	87	76	116	191	31
Cambodia	**108**	115	111	89	76	57	135	137
Dominican Republic	**109**	121	72	72	76	96	99	148
Tanzania	**110**	107	97	99	76	89	100	167
Bosnia and Herzegovina	**111**	90	123	92	76	186	92	139
Brunei Darussalam	**112**	121	130	69	76	82	168	84
Angola	**113**	91	138	139	76	65	112	104
Nicaragua	**114**	67	118	115	76	157	141	160
Lebanon	**115**	121	95	91	76	171	116	113
Kyrgyz Republic	**116**	114	102	111	76	194	91	150

Country/region	Overall Rank	Cost	Labor	Infra-structure	Industry	Geo-political Risk	Economy	Tax Policy
Mozambique	**117**	101	131	124	76	114	129	125
Uzbekistan	**118**	111	143	143	76	70	58	64
Eswatini	**119**	121	86	98	76	180	193	63
Bolivia	**120**	118	139	125	71	166	119	186
Cote d'Ivoire	**121**	121	109	119	76	59	101	175
Belarus	**122**	99	145	143	76	98	41	99
Lao People's Democratic Republic	**123**	121	64	114	76	123	132	155
Paraguay	**124**	121	133	123	76	131	107	127
Trinidad and Tobago	**125**	121	76	95	76	159	126	166
Benin	**126**	121	9	126	76	111	154	176
Yemen	**127**	121	135	136	76	155	144	83
Mali	**128**	121	96	122	76	125	127	165
Malawi	**129**	121	107	128	76	104	159	134
Nepal	**130**	121	125	118	76	113	124	158
Sierra Leone	**131**	121	120	133	76	165	172	88
Kosovo	**132**	96	149	143	76	151	105	44
Liberia	**133**	121	122	134	76	194	188	67
Zimbabwe	**134**	121	98	117	76	179	146	145
Congo Democratic Republic	**135**	121	124	129	76	110	106	180
Burkina Faso	**136**	121	117	132	76	107	138	153
Bhutan	**137**	121	146	141	76	102	175	15
Gambia	**138**	121	65	121	76	193	189	169
Puerto Rico	**139**	80	148	143	76	134	81	162
Lesotho	**140**	121	121	140	76	182	199	108
Mauritania	**141**	121	74	130	76	171	176	178
Burundi	**142**	121	104	137	76	178	196	138
Haiti	**143**	121	134	131	76	191	156	147
Chad	**144**	121	100	138	76	141	148	188
Guinea	**145**	121	128	135	76	127	151	181
Bahamas	**146**	121	156	143	76	139	150	50
Madagascar	**147**	121	141	142	76	115	134	132
Turkmenistan	**148**	94	147	143	76	176	69	190
Andorra	**149**	85	155	143	76	124	90	190
Iraq	**150**	121	156	143	76	90	97	129
Sao Tome and Principe	**151**	112	153	143	76	200	114	135

Country/region	Overall Rank	Cost	Labor	Infra-structure	Industry	Geo-political Risk	Economy	Tax Policy
Belize	**152**	121	150	143	76	201	167	52
Solomon Islands	**153**	121	156	143	76	168	190	38
Myanmar (Burma)	**154**	121	156	143	76	85	118	126
South Sudan	**155**	121	156	143	76	174	143	66
Barbados	**156**	121	152	143	76	132	174	93
San Marino	**157**	121	156	143	76	148	207	42
St. Lucia	**158**	121	156	143	76	146	181	73
Vanuatu	**159**	121	156	143	76	176	195	58
US Virgin Islands	**160**	83	154	143	76	156	128	190
Papua New Guinea	**161**	121	156	143	76	153	145	111
Syria	**162**	121	156	143	76	197	162	85
Libya	**163**	121	156	143	76	199	109	128
Fiji	**164**	121	156	143	76	144	177	98
Samoa	**165**	121	156	143	76	170	198	74
Marshall Islands	**166**	121	156	143	76	162	207	70
Dominica	**167**	121	156	143	76	187	201	75
Sudan	**168**	121	156	143	76	133	111	163
Kiribati	**169**	121	156	143	76	118	203	96
Suriname	**170**	121	151	143	76	203	166	105
Djibouti	**171**	121	156	143	76	173	164	108
Niger	**172**	121	144	143	76	120	158	161
Micronesia, Federated States of	**173**	121	156	143	76	111	205	110
St. Vincent and the Grenadines	**174**	121	156	143	76	160	194	103
Macau	**175**	121	156	143	76	92	96	190
Palestinian Authority	**176**	121	156	143	76	205	163	107
Tonga	**177**	121	156	143	76	169	204	100
Guyana	**178**	121	156	143	76	198	170	119
Grenada	**179**	121	156	143	76	167	157	142
St. Kitts and Nevis	**180**	121	156	143	76	185	185	124
Maldives	**181**	121	156	143	76	202	171	117
Palau	**182**	121	156	143	76	183	207	106
Togo	**183**	121	156	143	76	117	152	172
Antigua and Barbuda	**184**	121	156	143	76	192	160	144
East Timor	**185**	121	156	143	76	136	202	140

Country/region	Overall Rank	Cost	Labor	Infra-structure	Industry	Geo-political Risk	Economy	Tax Policy
Eritrea	**186**	121	156	143	76	196	155	152
Afghanistan	**187**	121	156	143	76	142	147	177
Gabon	**188**	121	156	143	76	161	137	183
North Korea	**189**	121	142	143	76	189	136	190
Reunion	**190**	121	156	143	76	105	139	190
Cuba	**191**	121	156	143	76	140	131	190
Liechtenstein	**192**	121	156	143	76	128	140	190
Congo	**193**	121	156	143	76	175	161	185
Guinea-Bissau	**194**	121	156	143	76	207	183	154
Bermuda	**195**	121	156	143	76	145	153	190
French Guiana	**196**	121	156	143	76	121	178	190
Comoros	**197**	121	156	143	76	204	186	168
Cayman Islands	**198**	121	156	143	76	138	173	190
Curacao	**199**	121	156	143	76	129	184	190
Aruba	**200**	121	156	143	76	135	182	190
Equatorial Guinea	**201**	121	156	143	76	208	165	179
Martinique	**202**	121	156	143	76	137	180	190
Central African Republic	**203**	121	156	143	76	206	169	187
Guam	**204**	121	156	143	76	158	187	190
Anguilla	**205**	121	156	143	76	184	179	190
American Samoa	**206**	121	156	143	76	130	206	190
Tuvalu	**207**	121	156	143	76	188	197	190
Somalia	**208**	121	156	143	76	190	200	190
Sint Maarten (SXM)	**209**	121	156	143	76	209	192	190

Complete state rankings

State	Overall Rank	Cost	Labor	Infrastructure	Industry	Economy	Tax Policy
Washington	**1**	35	11	1	1	5	26
Georgia	**2**	8	20	15	7	10	5
California	**3**	49	13	3	2	2	22
Michigan	**4**	23	28	23	14	3	1
Illinois	**5**	40	12	4	11	4	31
Indiana	**6**	18	41	11	10	7	2
North Carolina	**7**	19	24	38	6	9	4
Ohio	**8**	32	35	8	4	8	8
Arizona	**9**	14	25	17	5	21	9
Oregon	**10**	24	17	14	19	18	13
Pennsylvania	**11**	36	21	10	13	13	23
Texas	**12**	37	32	18	3	1	33
Virginia	**13**	30	6	28	20	19	19
Colorado	**14**	42	5	6	23	27	15
Connecticut	**15**	48	2	25	15	30	6
Massachusetts	**16**	51	1	18	21	15	14
Missouri	**17**	38	27	16	17	24	3
Utah	**18**	9	16	36	33	26	7
New York	**19**	41	8	8	12	11	51
Tennessee	**20**	6	39	41	24	12	11
Wisconsin	**21**	33	34	7	25	14	21
Florida	**22**	38	30	36	8	6	33
Kansas	**23**	28	14	20	18	36	23
New Jersey	**24**	43	10	2	31	16	41
Alabama	**25**	14	44	34	9	22	18
Maryland	**26**	50	4	20	30	29	17
New Hampshire	**27**	29	9	24	36	33	11
Minnesota	**28**	45	15	12	28	23	30
South Carolina	**29**	7	36	50	16	20	29
Oklahoma	**30**	11	45	13	29	35	10
Louisiana	**31**	25	47	28	21	17	32
Delaware	**32**	13	19	30	41	44	20
Arkansas	**33**	4	48	32	27	31	28
Kentucky	**34**	5	46	49	26	25	37
Idaho	**35**	3	42	27	44	37	25
Iowa	**36**	20	37	25	32	31	36
Nebraska	**37**	16	26	34	38	38	35
Nevada	**38**	2	49	51	34	28	38
Rhode Island	**39**	22	18	42	40	45	39

State	Overall Rank	Cost	Labor	Infrastructure	Industry	Economy	Tax Policy
District of Columbia	**40**	27	3	33	49	47	42
New Mexico	**41**	12	33	39	35	43	46
Montana	**42**	1	29	42	48	41	47
Alaska	**43**	47	31	5	51	51	16
Mississippi	**44**	10	50	30	37	34	45
South Dakota	**45**	17	40	46	47	46	26
Vermont	**46**	46	7	48	45	48	50
Hawaii	**47**	34	23	22	50	50	42
North Dakota	**48**	31	38	45	39	42	44
Wyoming	**49**	21	43	40	42	49	40
Maine	**50**	44	22	47	46	40	48
West Virginia	**51**	26	51	44	43	39	49
Puerto Rico	**52**	52	52	52	52	52	52

Contacts

To have a deeper conversation about the aerospace manufacturing industry and the issues discussed in this paper, please contact one of the following:

Scott Thompson
Partner, US Aerospace & Defense leader
703.918.1976
scott.thompson@pwc.com

Cihan Ergul
Manager, Analytic Insights
646.456.2143
cihan.ergul@pwc.com

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