



MEMORANDUM

Date: July 22, 2016

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

A handwritten signature in black ink, appearing to read "CHH", is written over the printed name "C.H. Huckelberry".

Re: **Aerospace Manufacturing Attractiveness Rating 2016**

Attached is an article that indicates Arizona ranks first in the United States in attracting future aerospace manufacturing. This report bodes well for our Sonoran Corridor and the efforts made by the Board of Supervisors in improving the aerospace, manufacturing and technology employment attractiveness of Pima County.

We are fortunate to be anchored by Raytheon Missile Systems as a private aerospace defense contractor, as well as Davis-Monthan Air Force Base (DMAFB). We need to continue to emphasize and capitalize on these advantages. The County in the past has invested public funding to promote the Sonoran Corridor; the buffering of Raytheon; expansion of Tucson International Airport; mission continuation and expansion of both DMAFB and the 162nd Arizona Air National Guard.

We believe we are positioned appropriately to take advantage of significantly accelerated employment and wage growth in the aerospace and defense industry. This survey confirms what we believe is our economic future in both aerospace, defense and near space commercialization.

Our belief has been absolutely confirmed by the recent 2016 Aerospace Manufacturing Attractiveness Ranking by PricewaterhouseCoopers, a well-known and respected national business, accounting and policy consulting firm.

CHH/anc

Attachment

c: John Bernal, Deputy County Administrator for Public Works
Tom Burke, Deputy County Administrator for Administration
Jan Leshar, Deputy County Administrator for Community and Health Services
Dr. John Moffatt, Director, Economic Development

2016 Aerospace Manufacturing Attractiveness Rankings

July 2016

At a glance

Download: 2016 Aerospace Manufacturing Attractiveness Rankings



This analysis looks at how countries and states in the US compare in terms of their attractiveness as locations for commercial aircraft manufacturing.

Welcome to the 2016 Aerospace Manufacturing Attractiveness Rankings. This is the third consecutive year of this analysis and we continue to refine our methodology to provide the most meaningful comparison of states and countries regarding the manufacturing environment for aerospace companies. Our quantitative framework can help provide industry leaders with information to optimize the supply chain, control costs, and plan for future growth.

The United States maintained its first place ranking for the third year in a row because of the breadth of its aerospace industry, which is seven times greater than the United Kingdom who ranked second in industry size.

Other countries in the top 10 include Canada, United Kingdom, Singapore, Switzerland, Denmark, Hong Kong SAR, China, Netherlands, Ireland, and Finland.

Top 10 countries by rank for aerospace manufacturing attractiveness

Country	Cost rank	Industry rank	Infrastructure rank	Overall rank
United States	22	1	18	1
Canada	3	6	9	2
United Kingdom	16	2	9	3
Singapore	4	17	3	4
Switzerland	7	20	1	5
Denmark	6	54	6	6
Hong Kong SAR, China	9	31	5	7
Netherlands	18	14	4	8
Ireland	2	40	20	9
Finland	21	31	2	10

Sources: PwC analysis; Oxford Economics; "Capital IQ Company Screening Report", S&P Global Market Intelligence; "The Global Competitiveness Report 2015-2016", World Economic Forum.

Among state rankings, Arizona jumped to first place with improvements in the state's industry rank and operating costs, as well as high scores in property and unemployment tax. Florida dropped one rank from last year to take second place, but its Space Coast still remains a hot spot with companies developing facilities in that area. Utah, Georgia, Missouri, Texas, Michigan, and Ohio remained in the top 10, and newcomers included Indiana and Washington.

Top 10 US states by rank for aerospace manufacturing attractiveness

State	Tax rank	Opex rank	Industry rank	Education rank	Overall rank
Arizona	8	12	6	20	1
Florida	4	29	5	13	2
Utah	3	10	24	25	3
Georgia	19	19	10	14	4
Missouri	2	12	29	21	5
Indiana	6	17	15	28	6
Texas	38	18	2	10	7
Michigan	26	25	2	17	8
Ohio	16	33	4	17	8
Washington	29	24	13	11	10

Sources: PwC analysis; "Capital IQ Company Screening Report", S&P Global Market Intelligence; "State Corporate Income Tax Rates", Tax Foundation; "American Community Survey", United States Census Bureau; "Occupational Employment Statistics", United States Department of Labor; Bureau of Labor Statistics; "Electric Power Monthly", U.S. Energy Information Administration.

Industrial Products

Aerospace and defense

Business & professional services

Chemicals

Engineering & construction

Forest, paper & packaging

Industrial manufacturing

Metals

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2016 Aerospace Manufacturing Attractiveness Rankings

July 2016

*Geographic manufacturing
attractiveness index and
analysis for the commercial
aircraft industry*



Welcome to the 2016 Aerospace Manufacturing Attractiveness Rankings. This is the third consecutive year of this analysis. We continue to refine our methodology to provide the most meaningful comparison of states and countries regarding the manufacturing environment for aerospace companies. Our quantitative framework can help provide industry leaders with information to optimize the supply chain, control costs, and plan for future growth.

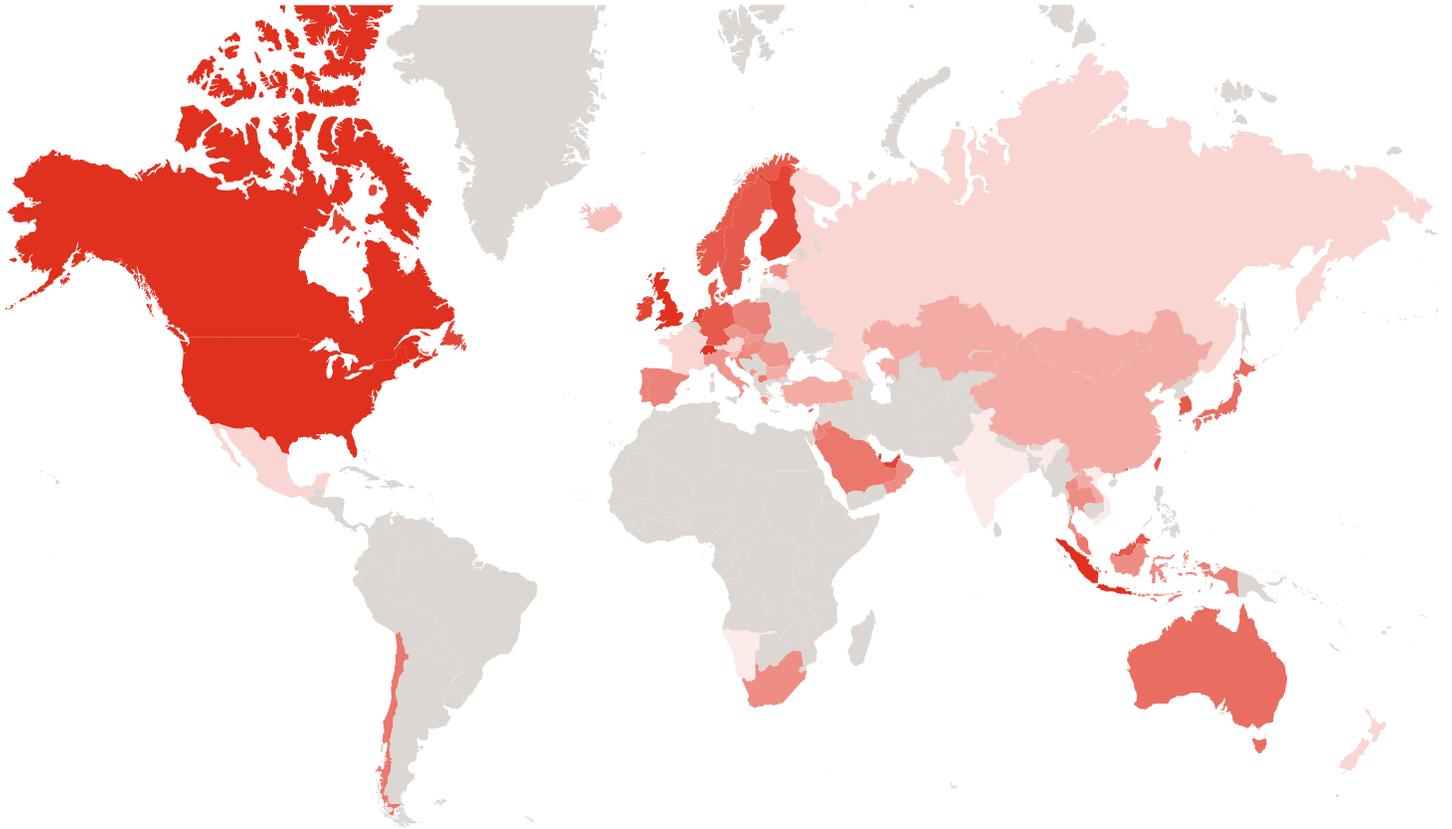
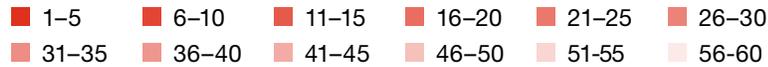
The 2016 index is based on a weighted average of variables. For the global rankings, the three categories of variables are costs, industry size, and infrastructure/stability/workforce. These categories are unchanged from the prior year. However, while the categories for the US state rankings are also unchanged, the variables have been refined. The tax category now includes unemployment and property tax in addition to corporate tax. The cost category no longer includes employment numbers for all occupations and double weights the average hourly wage for aerospace companies. The industry and education variables have remained the same. Details on the methodology are described in the Appendix as well as complete rankings for countries and US states.

We hope you find this annual aerospace attractiveness analysis informative and useful. We welcome your thoughts on the findings and its potential impact on your strategy.

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Global rankings and commentary



Top 10 countries by rank for aerospace manufacturing attractiveness

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Netherlands	18	14	4	8
Ireland	2	40	20	9
Finland	21	31	2	10

Sources: PwC analysis; Oxford Economics; "Capital IQ Company Screening Report", S&P Global Market Intelligence; "The Global Competitiveness Report 2015-2016", World Economic Forum.
 Note: Please find complete study results in appendix.

Changes in the 2016 country rankings were primarily driven by the use of Oxford Economics data for pay and productivity rather than self-assessment data from the World Economic Forum Global Competitiveness Report. In 2015, pay and productivity, which along with tax rates comprise the cost category, was calculated largely based on a self-assessment survey, part of the World Economic Forum Global Competitiveness Report. This year, the methodology used productivity data from Oxford Economics, which included unit wage, manufacturing, and nominal costs. Oxford data is an independent source and will allow the rankings to be more consistent going forward.

Countries with relatively high wages and productivity levels moved up in the rankings with the change in pay and productivity data methodology. Specifically, within the top 10 rankings, the UAE, Luxembourg, and Qatar were replaced by Denmark, the Netherlands, and Finland.

The United States maintained its first place ranking for the third year in a row because of the breadth of its

aerospace industry, which is seven times greater than the United Kingdom which ranked second in industry size. This past year, Airbus made a major commitment in the US with its jetliner assembly line in Mobile, Alabama, the company's first production site in America. Some additional US manufacturing investments include Boeing's new propulsion engineering and assembly facility in South Carolina and construction of Northrop Grumman's Unmanned Aerial Systems facility in North Dakota.

The US also attracted the most investment in research and development (R&D), including investments made by United Technologies Corporation (UTC), Raytheon, and Lockheed Martin, among others. UTC broke ground on a new R&D facility in Connecticut to expand capabilities in intelligent systems, advanced materials and manufacturing, and revolutionary propulsion and power technologies.¹ Raytheon is expanding its cybersecurity program with a new facility in Virginia², and Lockheed Martin's new missile defense technology laboratory opened at its Silicon Valley site.³

The US' rankings in the other two categories (cost and infrastructure) were toward the bottom of the top 10 countries, but not low enough to offset its industry rank. The US also scored highly (fourth) for the quality of its scientific research institutions. The UK scored highly in that area as well, coming in second after Switzerland.

Canada moved into the second spot, from sixth place last year, with improved rankings from the prior year in the three major categories. The UK went from fifth to third place, primarily as a result of an improved tax ranking. Singapore (fourth), Switzerland (fifth) and Hong Kong (seventh) had slightly lower rankings this year due to changes in the pay and productivity measurement. On the other hand, the methodology change improved the rankings of Denmark (sixth), the Netherlands (eighth), Ireland (ninth), and Finland (tenth).

Denmark moved up seven places in the rankings to come in sixth due to improvements in costs and aerospace workforce education, research, and training. The forward movement in rankings is likely to be supported in the near term by the involvement

1 "United Technologies Research Center Breaks Ground on State-of-the-Art Research and Development Facility in East Hartford". *United Technologies Research Center*. June 22, 2015. Web.

2 Raytheon Company. (June 3 2015). "Raytheon Opens State-of-the-Art Global Cyber Solutions Center in Washington, D.C. Area" [Press release].

3 Lockheed Martin. (April 30, 2015). "New Missile Defense Seeker Lab Opens at Lockheed Martin's Silicon Valley Site" [Press release].

of the Danish aerospace industry in helping to produce F-35 jets, which will be sold globally as well as in Denmark to replace the country's aging air force fleet.⁴ Lockheed Martin estimates that the F-35 order will result in \$356M in contracts to 12 Danish companies.⁵

After falling out of the top 10 rankings last year, the Netherlands now ranks eighth as a result of an improvement in the overall cost metric. The positive adjustment in pay and productivity was enough to counter an increase in the total tax rate rankings for the country. Additionally, the improvement in manufacturing attractiveness comes at a beneficial time for Bombardier Commercial Aircraft, as it has recently renewed a strategic alliance with Dutch aircraft manufacturer Fokker Services to provide the ABACUS FLY program to operators of Dash 8/Q Series 100/200/300 aircraft. The renewal extends the alliance by three years and is aimed at improving the availability of components and reducing operator repair and overhaul costs.⁶

Considerations for your business

Demand for aircraft is strong in most regions of the world, but especially in rapidly growing foreign markets such as China, India, and Brazil. These countries, with burgeoning middle classes and large and increasing populations, offer significant opportunities for US aircraft manufacturers and drive both international and domestic expansion. However, some global markets pose greater risk than others. To mitigate these risks, US companies have to understand each country's specific regulations, tax policies, and intellectual property protection laws. Also, companies have to address human resource issues such as talent recruitment, training, and retention, which can be particularly difficult in some markets and require knowledge of cultural norms and sensitivities. These risks need to be measured against the soundness of offshoring to extend supply chains overseas. In recent years, some companies have moved to re-shore all or part

of their supply chain as domestic business conditions have become more competitive. To support this new resurgence in American aerospace manufacturing, companies, educators, and policy makers need to promote the skills and policies that will foster investment growth in the US.

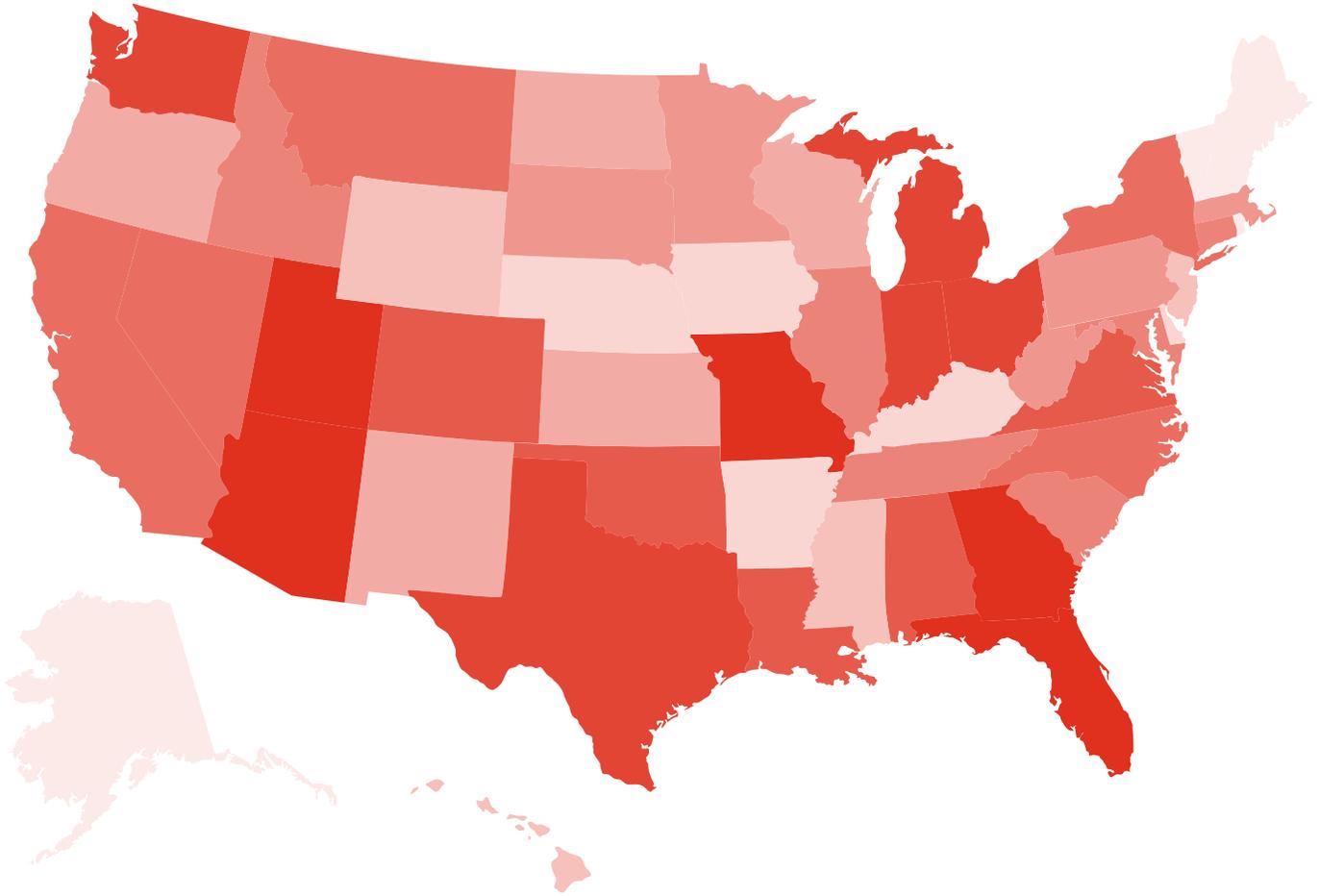
4 "Danish coalition to back \$3 billion Lockheed fighter jet deal". *Reuters*. June 9, 2016.

5 "Denmark: Future air power". *Lockheed Martin*. <https://www.f35.com/global/participation/denmark>.

6 Bombardier. (April 26, 2016). "Bombardier and Fokker Renew Agreement to Support Dash 8/Q Series 100/200/300 Aircraft" [Press release].

State rankings and commentary

1-5 6-10 11-15 16-20 21-25 26-30 31-35 36-40 41-45 46-50



Top 10 US states by rank for aerospace manufacturing attractiveness

State	Tax rank	Opex rank	Industry rank	Education rank	Overall rank
Arizona	8	12	6	20	1
Florida	4	29	5	13	2
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Utah	3	10	24	25	3
Missouri	2	12	29	21	5
Indiana	6	17	15	28	6
Texas	38	18	2	10	7
Michigan	26	25	2	17	8
Ohio	16	33	4	17	8
Washington	29	24	13	11	10

Sources: PwC analysis; “Capital IQ Company Screening Report”, S&P Global Market Intelligence; “State Corporate Income Tax Rates”, Tax Foundation; “American Community Survey”, United States Census Bureau; “Occupational Employment Statistics”, United States Department of Labor: Bureau of Labor Statistics; “Electric Power Monthly”, U.S. Energy Information Administration.

Note: Please find complete study results in appendix.

Among state rankings, Arizona jumped to first place. Florida dropped one rank from last year to take second place. Utah, Georgia, Missouri, Texas, Michigan, and Ohio remained in the top 10. Newcomers included Indiana and Washington. Utah and Georgia tied for third and Michigan and Ohio tied for eighth. Several states that were on last year's top 10 list did not make the cut this year including Virginia, North Carolina, and New York.

Below is a closer look at a few notable new industry initiatives among the top 10 states:

Arizona

Arizona jumped into the lead this year, with significant improvement in industry rank and operating costs. It also benefited from the tax methodology changes, with high scores in property tax (sixth) and unemployment tax (third). Its industry rank indicates a growing aerospace industry that includes the manufacture of guided missile systems, space and defense systems, and aviation and aerospace as well as maintenance repair and overhaul (MRO). Several of Arizona's major aerospace and aircraft employers posted strong gains in 2015, boosting employment opportunities.⁷ Bombardier Aerospace increased its workforce at the Tucson International Airport by almost 14 percent last year to service commercial and business aircraft.⁸

Florida

Florida moved into second place, primarily because of an increase in aerospace wages. But Florida's Space Coast is booming, with major new initiatives being planned in that area. In 2015, SpaceX said it was leasing launch pads at Cape Canaveral and the Kennedy Space Center.⁹ Also last year, Blue Origin announced it is building a production facility for manufacturing its fleet of orbital rockets in Florida and is planning to launch its orbital rockets from Cape Canaveral.¹⁰ Boeing opened a commercial spaceship plant at Cape Canaveral to build spaceships for NASA.¹¹

Michigan

Alcoa's Power and Propulsion division announced plans to invest \$16.7 million into a coatings facility, which will double the company's capacity for manufacturing coatings for jet engine parts.¹² In addition, Michigan is phasing out personal property tax for most businesses by 2025,¹³ which does not affect the 2015 score, but should improve scores in future years as it attracts manufacturers who rely on expensive capital investments in tools and other equipment.

Indiana

Indiana benefited from the tax methodology change because it ranks fifth and seventh in property tax and unemployment tax, respectively. It's also showing good industry growth. In the last two years, industry leaders have announced plans to invest more than \$900 million and create more than 1,200 new jobs in Indiana in the coming years. Alcoa opened a new engine parts facility in La Porte, which doubles the current capacity and provides new capabilities for production of large commercial aircraft engines.¹⁴ Rolls-Royce said it will invest almost \$600 million to modernize its Indianapolis operation, which includes manufacturing and assembly, and conduct technology research. This is the company's largest US investment since 1995.¹⁵

Washington

Washington placed tenth in the state rankings. While Boeing has had a large presence in the state since the company was founded in Seattle, in the past year, it invested more than \$1 billion in infrastructure to prepare for the manufacture of the next generation of airplanes.¹⁶

7 "Arizona's Aerospace & Defense Industry. *Arizona Commerce Authority*. June 6, 2016. www.azcommerce.com/industries/aerospace-defense

8 Witcher, David. "Aerospace Lifting off: Aerospace and aircraft employers here report employment gains". *Tuscon.com*. April 24, 2016.

9 Gruss, Mike. "SpaceX Leases Florida Launch Pad for Falcon Landings." *SpaceNews*. Feb. 10, 2016.

10 Chang, Kenneth. "Blue Origin, Jeff Bezos' Rocket Company, to Launch from Florida." *The New York Times*. Sept. 15, 2015.

11 Klotz, Irene. "Boeing opens commercial spaceship plant in Florida." *Reuters*. Sept. 4, 2015.

12 "Alcoa to expand coating production for aircraft engines in US." *Aerospace-Technology.com*. Dec. 12, 2014.

13 "Michigan Personal Property Tax Reform". *Michigan Economic Development Corporation*. March 2016.

Other noteworthy news

Connecticut ranked first in both the overall industry rank category and industry growth. There is a strong industry presence in the state and an extensive supply chain. This is in part due to the success of Pratt & Whitney's Geared Turbofan engine and the production ramp-up at its two manufacturing plants in Connecticut to deal with the order backlog.¹⁷

Airbus opened its first production site in 2015 in Mobile, Alabama, announcing it was making a “significant commitment” to the US. The site will be used to assemble the A320 family of aircraft. The first plane, an A321, was delivered to JetBlue in April.¹⁸

Considerations for your business

There are many criteria for locating a manufacturing plant or R&D facilities in a particular geographical area including the categories contained in this report. The category of education is critical not only for companies trying to meet today's demands, but in ensuring tomorrow's workforce can help build the next generation of more efficient, sustainable aircraft. An educated, technology-savvy, and diversified workforce is essential for maintaining US competitiveness in commercial aviation manufacturing. Some companies are actively participating in the process of preparing the future workforce. For example, Utah recently announced the expansion of Utah Aerospace Pathways program to a second school district. The program provides students in their last year of high school with the opportunity to begin training for an aerospace manufacturing certification. After students earn their certification, they can begin work with one of the programs aerospace partners in Utah. Seven aerospace companies have been involved in developing the program.¹⁹

14 Alcoa. (Oct. 29, 2015). “Alcoa Opens Advanced Jet Engine Parts Facility in Indiana” [Press release].

15 “Rolls-Royce to invest in Indianapolis facilities.” *Aerospace Manufacturing and Design*. Oct. 9, 2015.

16 “Boing in Washington: 2015 impact report”. *Boeing*. Jan. 15, 2016.

17 “Pratt & Whitney Shows Off Geared Turbofan Engine.” *Aero News Network*. May 20, 2016.

18 “First Alabama-made Airbus A321 ‘Blues Mobile’ goes to JetBlue.” *Alabama Department of Commerce*. April 25, 2016.

19 “Utah Aerospace Pathways Program Expanding to Iron County School District.” *Utahpolicy.com*. April 27, 2016.

Appendices

PwC 2016 global aerospace manufacturing attractiveness index

Methodology for country rankings

PwC’s analysis was based on a weighted average of three major categories: costs (taxes, manufacturing wages, and productivity), industry size ((number of existing suppliers), and infrastructure/stability/workforce (including quality of electrical and transportation infrastructure, regulatory/legal/corruption rankings and enrollments in, and quality of, engineering programs). To increase the accuracy of the pay and productivity sub-category, this year’s analysis was based on data from Oxford Economics and included unit wage, manufacturing, and nominal costs rather than

self-assessment data from the World Economic Forum Global Competitiveness Report. Oxford data will allow the rankings to be more consistent going forward. Data is only available for the largest countries so anything without a metric in Oxford Economics (e.g., Nigeria) is ranked as tied for last (142).

The following chart provides a view of category breakdowns and weighting percentages:

	2015 Methodology		2014 Methodology	
Overall	Total cost	33%	Total cost	33%
Overall	Total industry	33%	Total industry	33%
Overall	Total infrastructure	33%	Total infrastructure	33%
	Total ranking	100%	Total ranking	100%
Cost	Total tax rate (TTR)	50%	Total tax rate (TTR)	50%
Cost (see methodology above)	Pay and productivity	50%	Pay and productivity	50%
	Total cost	100%	Total cost	100%
Industry	Aerospace suppliers	100%	Aerospace suppliers	100%
	Total industry	100%	Total industry	100%
Infrastructure	Infrastructure*	33%	Infrastructure	33%
Infrastructure	Stability**	33%	Stability	33%
Infrastructure	Workforce***	33%	Workforce	33%
	Total infrastructure	100%	Total infrastructure	100%

*Infrastructure = Quality of railroads and electric supply

**Stability = Regulations, rule of law, and control of corruption

***Workforce = Quality of math and science education, availability of research and training services, and quality of scientific research

Complete raw data

Country	Cost rank	Industry rank	Infrastructure/ stability/ talent rank	Overall rank	Country	Cost rank	Industry rank	Infrastructure/ stability/ talent rank	Overall rank
Albania	98	54	82	88	Estonia	127	40	23	69
Algeria	140	54	106	133	Ethiopia	79	54	97	82
Angola	124	54	141	140	Finland	21	31	2	10
Argentina	77	54	101	85	France	38	4	17	21
Armenia	50	54	77	59	Gabon	121	54	113	127
Australia	31	13	16	19	Gambia, The	133	54	111	132
Austria	36	15	14	23	Georgia	47	54	54	47
Azerbaijan	108	54	83	99	Germany	33	5	7	12
Bahrain	44	54	48	41	Ghana	83	54	85	77
Bangladesh	77	54	122	104	Greece	27	40	51	38
Barbados	102	54	121	119	Guatemala	103	54	100	108
Belgium	48	22	11	29	Guinea	137	54	132	141
Bhutan	94	54	91	93	Guyana	81	54	108	95
Bolivia	142	54	114	136	Haiti	110	54	138	135
Botswana	60	54	69	61	Honduras	119	54	110	125
Brazil	69	27	95	75	Hong Kong SAR, China	9	31	5	7
Bulgaria	11	54	65	37	Hungary	34	40	39	33
Burkina Faso	112	54	134	133	Iceland	70	54	31	47
Burundi	110	54	132	131	India	61	9	60	57
Cambodia	53	54	123	82	Indonesia	16	54	55	32
Cameroon	125	54	104	125	Iran, Islamic Rep.	118	54	76	101
Canada	3	6	9	2	Ireland	2	40	20	9
Chad	134	54	137	142	Israel	73	17	29	46
Chile	13	40	38	25	Italy	51	11	33	40
China	64	3	45	45	Jamaica	93	54	88	90
Colombia	138	54	81	116	Japan	36	8	8	16
Costa Rica	131	54	40	78	Jordan	67	54	46	55
Côte d'Ivoire	128	54	66	101	Kazakhstan	66	40	67	62
Croatia	1	54	41	17	Kenya	100	54	80	88
Cyprus	58	54	43	47	Korea, Rep.	15	10	24	13
Czech Republic	30	25	25	27	Kuwait	43	54	93	64
Denmark	6	54	6	6	Kyrgyz Republic	65	54	118	92
Dominican Republic	115	54	124	130	Lao PDR	61	54	112	80
Egypt, Arab Rep.	120	54	115	128	Latvia	95	54	32	59
El Salvador	105	40	99	109	Lebanon	72	54	103	81

Complete raw data (continued)

Country	Cost rank	Industry rank	Infrastructure/ stability/ talent rank	Overall rank	Country	Cost rank	Industry rank	Infrastructure/ stability/ talent rank	Overall rank
Lesotho	46	54	98	67	Russian Federation	44	7	64	52
Libya	84	54	142	122	Rwanda	86	54	78	76
Lithuania	116	40	26	66	Saudi Arabia	5	36	44	24
Luxembourg	52	31	12	30	Senegal	122	54	68	97
Macedonia, FYR	42	54	57	44	Serbia	107	40	71	84
Madagascar	104	54	120	120	Seychelles	71	54	86	72
Malawi	90	54	116	112	Sierra Leone	74	54	136	114
Malaysia	26	23	22	22	Singapore	4	17	3	4
Mali	123	54	102	121	Slovak Republic	39	40	37	36
Malta	112	54	47	73	Slovenia	74	36	28	50
Mauritania	139	54	125	138	South Africa	14	29	62	35
Mauritius	56	54	56	54	Spain	28	12	30	28
Mexico	29	29	74	51	Sri Lanka	130	54	42	79
Moldova	109	54	92	106	Suriname	63	54	135	103
Mongolia	58	54	89	68	Swaziland	91	54	90	90
Montenegro	55	54	58	55	Sweden	25	16	15	15
Morocco	126	40	53	86	Switzerland	7	20	1	5
Mozambique	97	54	117	115	Taiwan, China	12	17	21	11
Myanmar	76	54	130	112	Tajikistan	141	54	96	129
Namibia	54	54	63	58	Tanzania	117	54	109	122
Nepal	67	54	126	100	Thailand	10	36	60	31
Netherlands	18	14	4	8	Timor-Leste	40	54	139	87
New Zealand	89	36	19	53	Trinidad and Tobago	80	54	70	70
Nicaragua	135	54	127	137	Tunisia	132	54	73	110
Nigeria	88	54	131	116	Turkey	34	23	59	42
Norway	24	31	13	14	Uganda	98	54	107	110
Oman	57	40	79	63	Ukraine	129	25	72	105
Pakistan	82	54	105	94	United Arab Emirates	8	31	35	18
Panama	101	54	52	71	United Kingdom	16	2	9	3
Paraguay	92	54	129	118	United States	22	1	18	1
Peru	95	54	94	95	Uruguay	114	54	49	74
Philippines	22	54	75	43	Venezuela, RB	136	54	128	138
Poland	19	20	36	26	Vietnam	106	54	84	97
Portugal	20	40	27	20	Yemen, Rep.	87	54	140	124
Qatar	41	54	34	34	Zambia	49	54	87	64
Romania	32	28	50	39	Zimbabwe	84	40	119	107

PwC 2016 US aerospace manufacturing attractiveness index

Methodology for state rankings

PwC's analysis was based on a weighted average of taxes, operating costs (industry and overall wage rates, business climate, energy costs), industry size (existing suppliers and supply/growth of workforce including available aerospace technicians, engineers, mechanics), and educational attainment.

The tax category was expanded to provide a more rounded picture of tax by including corporate tax (50%), unemployment tax (25%), and property tax (25%) rather than just corporate tax as in last year's report.

The cost category in this report included electricity (25%), average hourly wage for aerospace (50%), and average hourly wage for all occupations. In a change from the prior year, the analysis excluded employment for all occupations and gave additional weight to the average hourly wage for aerospace in order to highlight the aerospace environment rather than the general economy.

See the chart below for category breakdowns and weighting percentages.

	2015 Methodology		2014 Methodology	
OVERALL	Total tax	25%	Total tax	25%
OVERALL	Total costs	25%	Total costs	25%
OVERALL	Total industry	25%	Total industry	25%
OVERALL	Total education	25%	Total education	25%
	Total ranking	100%	Total ranking	100%
TAX	Corporate tax	50%	Corporate tax	100%
TAX	Unemployment tax	25%	Unemployment tax	0%
TAX	Property tax	25%	Property tax	0%
	Total tax	100%	Total tax	100%
OPEX	Electricity	25%	Electricity	25%
OPEX	Employment - all occupations	0%	Employment - all occupations	25%
OPEX	Average hourly wage - aerospace	50%	Average hourly wage - aerospace	25%
OPEX	Average hourly Wage - all occupations	25%	Average hourly wage - all occupations	25%
	Total costs	100%	Total costs	100%
INDUSTRY	Total aerospace employment	33%	Total aerospace employment	33%
INDUSTRY	Industry growth	33%	Industry growth	33%
INDUSTRY	Aerospace companies	33%	Aerospace companies	33%
	Total industry	100%	Total industry	100%
EDUCATION	Bachelors	20%	Bachelors	20%
EDUCATION	Masters	20%	Masters	20%
EDUCATION	Doctorate	20%	Doctorate	20%
EDUCATION	Bachelor or higher	20%	Bachelor or higher	20%
EDUCATION	Graduate or professional	20%	Graduate or professional	20%
	Total education	100%	Total education	100%

Complete raw data

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

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

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