

W. Frank Barton School of Business

Center for Economic Development and Business Research

Kansas Aviation Manufacturing Sector

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**Center for Economic Development
and Business Research**



**WICHITA STATE
UNIVERSITY**

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This report provides data on the aviation manufacturing sector in Kansas. The data are principally based on information collected in the County Business Patterns from the U.S. Census Bureau and the Occupational Employment Statistics by State and Industry from the Bureau of Labor Statistics.

Kansas Aviation Manufacturing Sector: Overview

Definition

The aviation manufacturing sector refers to a variety of establishments predominantly engaged in one or more of the following:

- aircraft, missile, or space vehicles manufacturing
- aircraft engine and engine parts manufacturing
- developing and making prototypes of aerospace products
- aircraft conversion
- complete aircraft or propulsion systems overhaul and rebuilding.

This sector is classified by the U.S. Census Bureau’s North American Industrial Classification System as sector 3364 or aerospace product and parts manufacturing.

A Strength

The location quotient technique indicates that Kansas has a high concentration in its aviation manufacturing sector. Location quotient is defined as a ratio between a percentage of regional industry employment and a percentage of national industry employment. It determines whether a geographic area has a greater share of an industry or a sector than the nation as a whole. A region is said to be specialized when its location quotient is higher than 1.20. The table below indicates that Kansas is specialized in aviation manufacturing since its location quotient was very high in 2011 (7.5).

<i>Kansas Aviation Manufacturing Statistics in 2011</i>		
	2007	2011
Number of Establishments	86	87
Number of Jobs	32,010	27,728
Percent of all Kansas Jobs	2.7%	2.5%
Average Annual Wage	\$ 63,930	\$ 73,495
Total Wages Paid	\$ 2,046,386,000	\$ 2,037,856,000
Level Change in Total Wages Paid from 2007	-	\$ (8,530,000)
Percent Change in Total Wages Paid from 2007	-	-0.4%
Location Quotient	8.1	7.5
Source: County Business Patterns, U.S. Census Bureau.		

Moreover, the aviation manufacturing sector contributed to 26.3 percent of the manufacturing industry’s total wages and 18 percent of manufacturing employment in Kansas in 2011.¹

¹ Source: County Business Patterns, U.S. Census Bureau.

Additional Facts

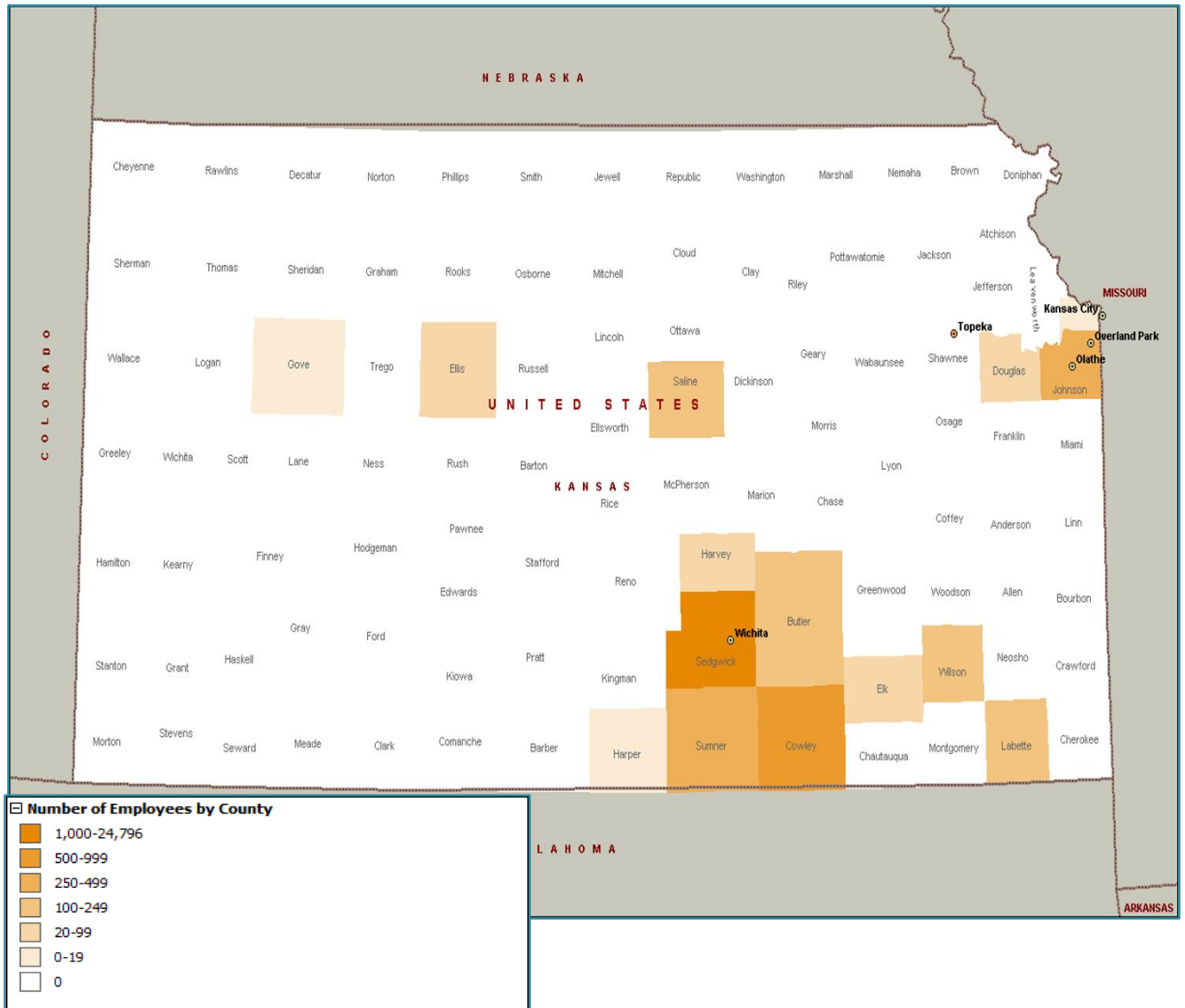
- Sedgwick County employed 89.4 percent of all aviation manufacturing employees in the state of Kansas in 2011.
- In 2012, the production (40.7 percent) and architecture and engineering (16.4 percent) occupations within the Kansas aviation manufacturing sector employed the most workers.
- The largest occupational needs for aviation manufacturing from 2010 to 2020 will be for machinists; inspectors, testers, sorters, samplers, and weighers; and first-line supervisors/managers of production and operating workers.
- Occupations requiring moderate-on-the-job training dominate the aviation manufacturing sector, and the largest need from 2010 to 2020 will be for high school diploma (or equivalent) holders.
- Kansas aviation manufacturing productivity rose by 55.5 percent from 2009 to 2011.
- Kansas attracted the fourth highest level of aerospace and aeronautical research dollars in the nation, with 8.3 percent and 6.6 percent of total dollars in the field in 2009 and 2011, respectively.
- Kansas aviation manufacturing exports to Europe were the highest between 2007 and 2012, compared to the other continents. Kansas volume of aviation manufacturing sales to North America increased continuously from 2010 to 2012.
- Kansas aviation manufacturing imports from North America were the largest between 2008 and 2012 and they increased by 79.2 percent between 2010 and 2012.

Kansas Aviation Manufacturing Sector: Trends

Key Locations

Some counties in Kansas have a greater share of the aviation manufacturing sector. As the map below shows, most of those counties are located in southeastern Kansas.

Aviation Manufacturing Employees by County in Kansas in 2011



Source: County Business Patterns, U.S. Census Bureau.

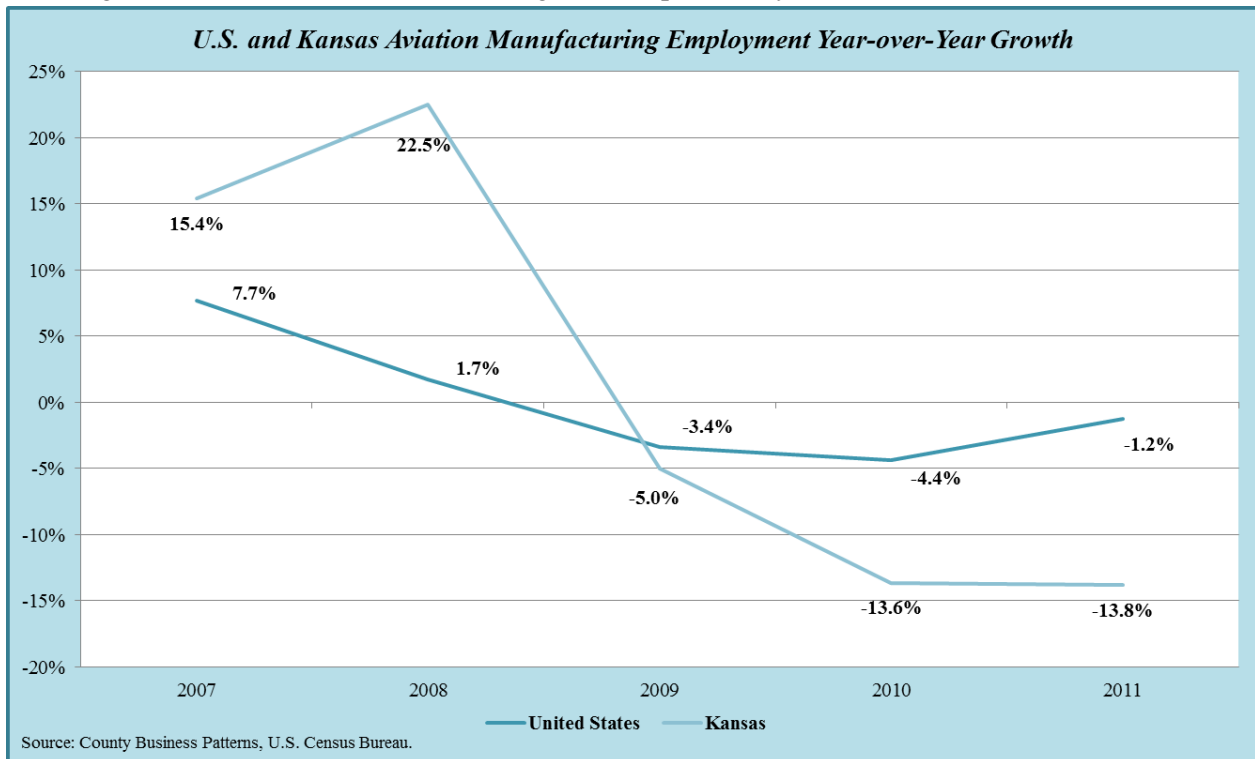
Sedgwick County has the most aviation manufacturing employees in Kansas. Sedgwick County’s aviation manufacturing sector is a significant source of wages in the state, 91.3 percent of total aviation manufacturing wages in 2011.² Sedgwick County’s aviation manufacturing sector also contributed 89.4 percent of all aviation manufacturing employees in Kansas the same year. Sedgwick County was home to 61 aviation manufacturing establishments in 2011. Cowley County had the second largest employment number, followed by Johnson and Sumner Counties.

² Wichita Metropolitan Statistical Area’s aviation manufacturing sector is a significant source of wages in the state, 93 percent of total aviation manufacturing wages in 2011. The sector in the metro area also contributed 91.9 percent of all aviation manufacturing employees in Kansas the same year. Source: County Business Patterns, U.S. Census Bureau.

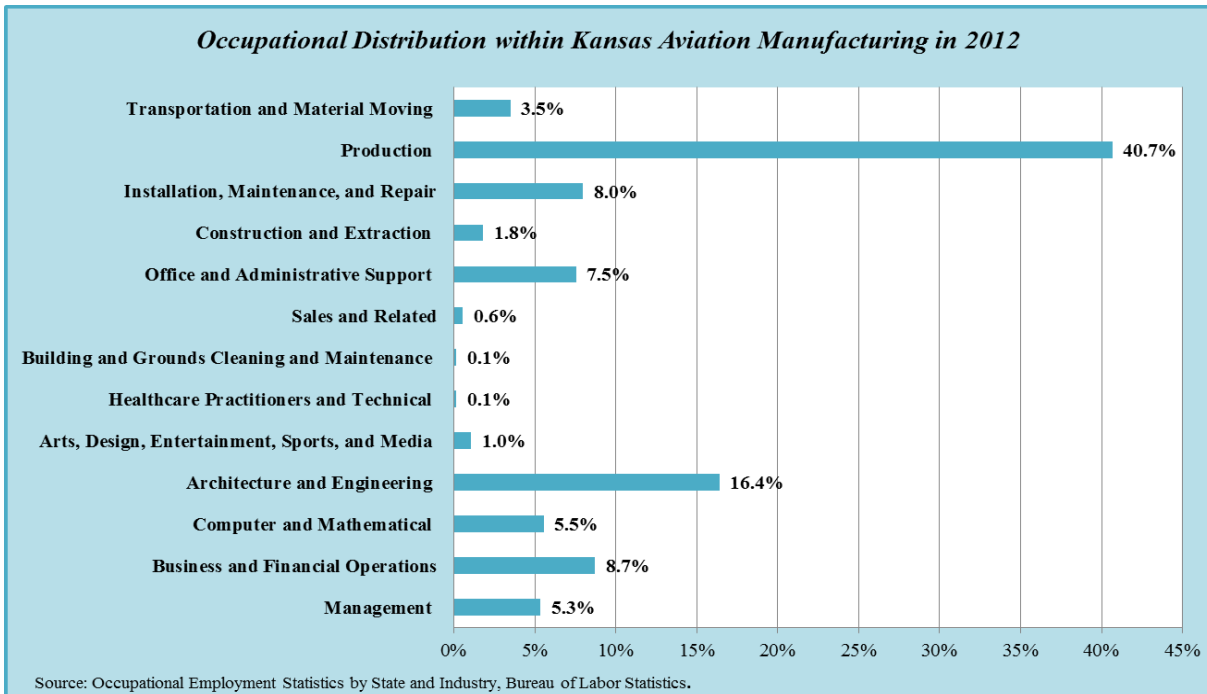
Top Four Aviation Manufacturing Counties by Employment in Kansas in 2011			
Rank	County	Employment	Percent of Industry Total
1	Sedgwick	24,796	89.4%
2	Cowley	500-999	1.8% - 3.6%
3	Johnson	250-499	0.9% - 1.8%
4	Sumner	420	1.5%
Industry's Total		27,728	100%
Source: County Business Patterns, U.S. Census Bureau.			

Employment

Kansas aviation manufacturing was seriously hit in 2009 by the latest recession when the sector's annual employment growth dropped to -5.03 percent from 22.53 percent in 2008. Employment growth kept declining between 2010 and 2011 at an average of 13.7 percent a year.



The Occupational Distribution within Kansas Aviation Manufacturing in 2012 figure indicates that workers employed in aviation manufacturing were concentrated in production (40.7 percent) and architecture and engineering occupations (16.4 percent).



The top five occupations within the sector, and particularly within the production and architecture and engineering occupations, in 2012 were:

- aerospace engineers
- aircraft structures, surfaces, rigging, and systems assemblers
- machinists
- inspectors, testers, sorters, samplers, and weighers
- aircraft mechanics and service technicians.

Ten Largest Occupations within the Kansas Aviation Manufacturing Sector in 2012			
Occupation	Employment	Mean Hourly Wage	Mean Annual Wage
Aerospace Engineers	2,990	\$ 45.24	\$ 94,090
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2,040	\$ 23.62	\$ 49,130
Machinists	1,700	\$ 20.85	\$ 43,370
Inspectors, Testers, Sorters, Samplers, and Weighers	1,300	\$ 25.24	\$ 52,490
Aircraft Mechanics and Service Technicians	1,230	\$ 29.13	\$ 60,580
First-line Supervisors of Production and Operating Workers	950	\$ 33.78	\$ 70,250
Purchasing Agents, except Wholesale, Retail, and Farm Products	780	\$ 32.87	\$ 68,370
Industrial Engineers	750	\$ 38.27	\$ 79,600
Computer-controlled Machine Tool Operators, Metal and Plastic	710	\$ 18.16	\$ 37,760
Production, Planning, and Expediting Clerks	670	\$ 26.62	\$ 55,360

Source: Occupational Employment Statistics by State and Industry, Bureau of Labor Statistics.

Since the aviation manufacturing sector represents an important share of Kansas employment, the top ten occupations across industries (following table) and within the aviation manufacturing sector in the state are the same.

Kansas Occupational Projections (across industries)

Occupation	Employment		Job Openings		Education and Work Experience			
	Base Year 2010	Projection Year 2020	New Jobs ¹	Replacement Needs ²	Total Jobs ³	Typical Education Needed for Entry ⁴	Work Experience in a Related Occupation ⁴	Typical On-The-Job Training Needed to Attain Competency ⁴
First-line Supervisors/Managers of Production and Operating Workers	7,660	8,027	367	1,001	1,368	Postsecondary non-degree award	1 to 5 years	None
Machinists	4,731	5,403	672	869	1,541	High school diploma or equivalent	None	Long-term on-the-job training
Inspectors, Testers, Sorters, Samplers, and Weighers	4,700	5,206	506	1,023	1,529	High school diploma or equivalent	None	Moderate-term on-the-job training
Purchasing Agents, except Wholesale, Retail, and Farm Products	3,478	3,729	251	932	1,183	High school diploma or equivalent	None	Long-term on-the-job training
Production, Planning, and Expediting Clerks	3,285	3,479	194	860	1,054	High school diploma or equivalent	None	Moderate-term on-the-job training
Aerospace Engineers	3,166	3,140	0	697	697	Bachelor's degree	None	None
Aircraft Mechanics and Service Technicians	2,565	2,773	208	774	982	Postsecondary non-degree award	None	None
Computer-controlled Machine Tool Operators, Metal and Plastic	1,961	2,462	501	374	875	High school diploma or equivalent	None	Moderate-term on-the-job training
Industrial Engineers	1,780	1,970	190	388	578	Bachelor's degree	None	None
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	1,297	1,553	256	249	505	High school diploma or equivalent	None	Moderate-term on-the-job training

Notes:

¹New Jobs are only openings due to growth and do not include job declines. If an occupation's employment change is negative, there is no job growth and new jobs are set to zero. New Jobs may not equal Numerical Change.

²Replacement Needs estimate the number of job openings created when workers retire or permanently leave an occupation and need to be replaced.

³Total Jobs are the sum of new jobs and replacement needs.

⁴Education and Training Level is provided by the Bureau of Labor Statistics, http://www.bls.gov/temp_data_education_training.htm

Source: Kansas 10-Year Job Outlook 2010-2020, Kansas Department of Labor.

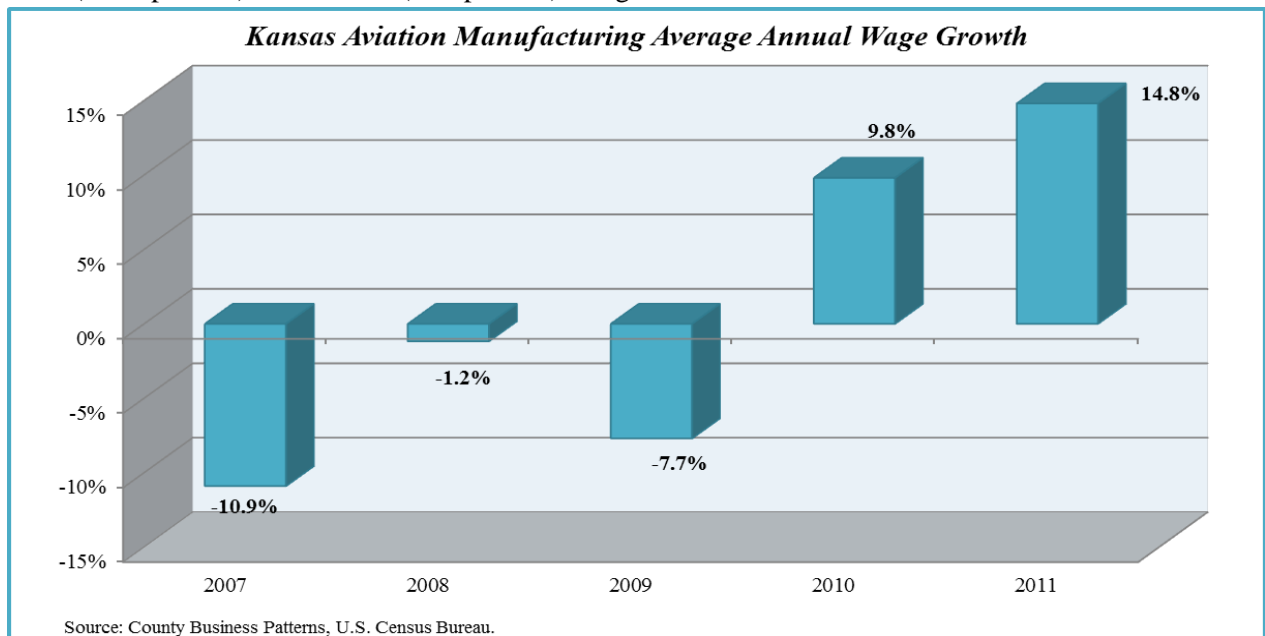
According to the Kansas Occupational Projections, the following occupations will create the highest number of jobs in Kansas between 2010 and 2020:

- machinists (1,541 job openings)
- inspectors, testers, sorters, samplers, and weighers (1,529 job openings)
- first-line supervisors/managers of production and operating workers (1,368 job openings).

The previous table also indicates that the occupations requiring moderate-on-the-job training dominate the aviation manufacturing sector, and the greatest need from 2010 to 2020 will be for high school diploma (or equivalent) holders.

Wages

Kansas aviation manufacturing's annual wage growth was negative during the recession, particularly in 2007 (-10.9 percent) and in 2009 (-7.7 percent). Wages started to recover in 2010.



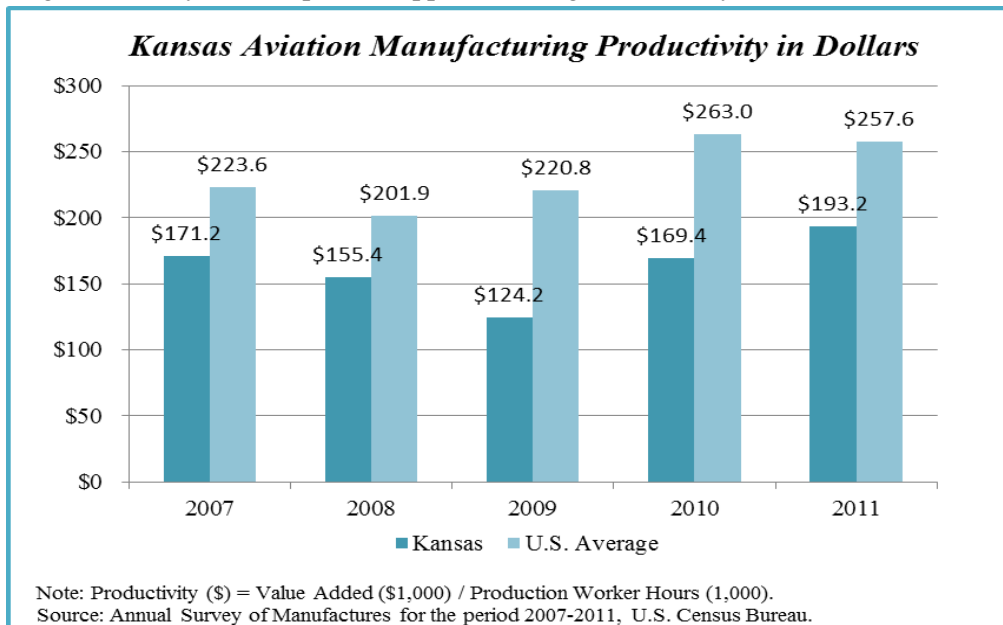
The Ten Largest Occupations within the Kansas Aviation Manufacturing Sector in 2012 table indicates that the top five highest paying occupations within the sector were:

- aerospace engineers
- industrial engineers
- first-line supervisors of production and operating workers
- purchasing agents, except wholesale, retail, and farm products
- aircraft mechanics and service technicians.

Productivity

Aviation manufacturing productivity in Kansas represented an average of 69.9 percent of the national average productivity between 2007 and 2011. Productivity declined at a growing rate during the recession; in fact, it decreased by 9.2 percent between 2007 and 2008, and 20.1 percent between 2008 and 2009. Productivity increased to \$169.4 in 2010, and rose again in 2011 to \$193.2, its highest level during

the period 2007-2011. Subsequently, most of the increase in aviation manufacturing productivity in Kansas through that five-year time period happened during the recovery.



Research and Development Programs

Aeronautical and astronautical engineering research is usually conducted within the engineering department of universities. The state of Kansas has several universities doing aviation research; those institutions attract a high level of research dollars.

Institution	2009		2011	
	Dollars in Thousands	Percent of National Total	Dollars in Thousands	Percent of National Total
Wichita State University	\$ 50,023,000	8.1%	\$ 42,242,000	6.3%
Kansas State University	\$ 175,000	0.1%	\$ 1,121,000	0.2%
University of Kansas	\$ 748,000	0.0%	\$ 590,000	0.1%
Pittsburg State University	\$ 11,000	0.0%	\$ 12,000	0.0%
Kansas Total	\$ 50,957,000	8.3%	\$ 43,965,000	6.5%

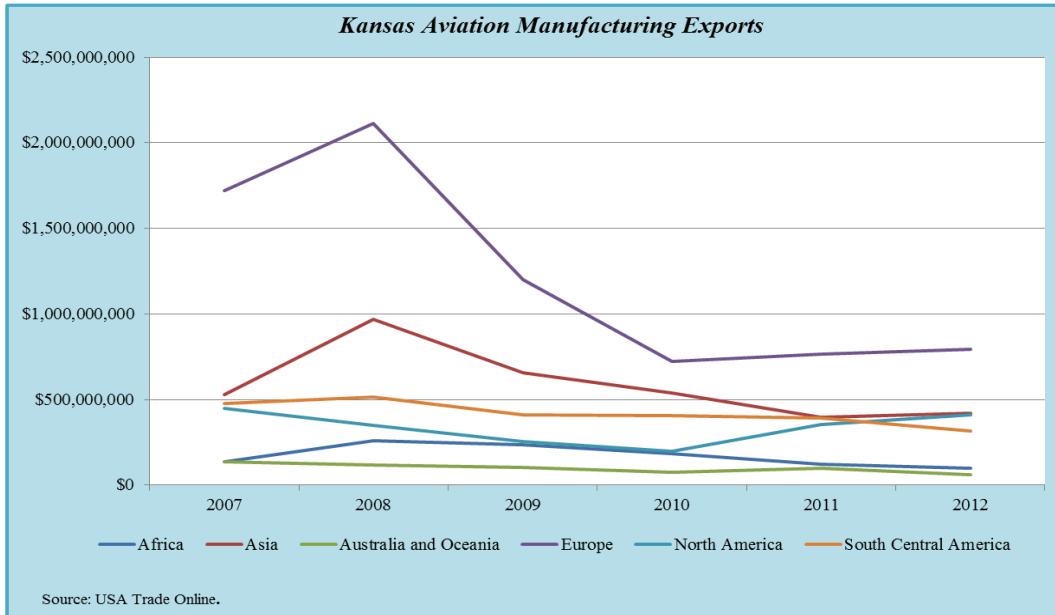
Source: Higher Education Research and Development: Fiscal Years 2009 and 2011, National Science Foundation.

Kansas attracted the fourth highest level of aerospace and astronautical research dollars in the nation, with 8.3 percent and 6.5 percent of total dollars in the field in 2009 and 2011, respectively. A large proportion of this research was completed at Wichita State University, one of the largest aviation research and development programs in the United States. Wichita State University's engineering department and the National Institute for Aviation Research (NIAR) conduct aerospace research. NIAR is a department of Wichita State University, operating on a nonprofit budget that exceeded \$49 million in fiscal year 2011. The institute runs 135,000 square feet of research and office space and has 350 employees.³

³ Source: National Institute for Aviation Research.

Exports and Imports

Seriously affected by the last recession, Kansas aviation manufacturing exports to Africa, Asia, Europe, and South Central America declined from 2008. The largest drop-offs were towards the Australian and Oceanian and European continents where Kansas exports decreased by 54.1 percent and 53.9 percent between 2007 and 2012, respectively. Compared to other geographies, Kansas sales of aviation manufacturing to North America started a stronger recovery in 2010.



Kansas aviation manufacturing imports from Asia rose by more than \$100 million during the period 2008-2012. Kansas' purchases of aviation manufacturing products from North America increased by 79.2 percent between 2010 and 2012.

