

Ohio's Aerospace & Defense Industries

Aerospace products and parts manufacturing (NAICS 3364) includes establishments making complete aircraft, missiles or space vehicles as well as their engines and parts.

Ohio's Standing in Aerospace Manufacturing

- Ohio ranks 6th in the nation in the net value of aerospace products and parts produced here.
- The state ranks 8th based on total industry employment.
- Ohio ranks 2nd in value produced per worker, among all states where data are available.
- U.S. Bureau of Labor Statistics data for 2009 show there were 120 industry establishments whose average annual wage was \$83,823 – compared to the national average of \$81,595.

Employment Trends

- 15,200 were employed in aerospace manufacturing in Ohio during 2010 according to the U.S. Bureau of Labor Statistics; industry jobs have fluctuated between 14,200 and 16,900 during the last decade.
- Ohio's share of national industry employment has been 3.2 to 3.3 percent even as national totals ranged between 441,500 and 510,900 during the last decade. (U.S. industry employment was 477,100 in 2010.)

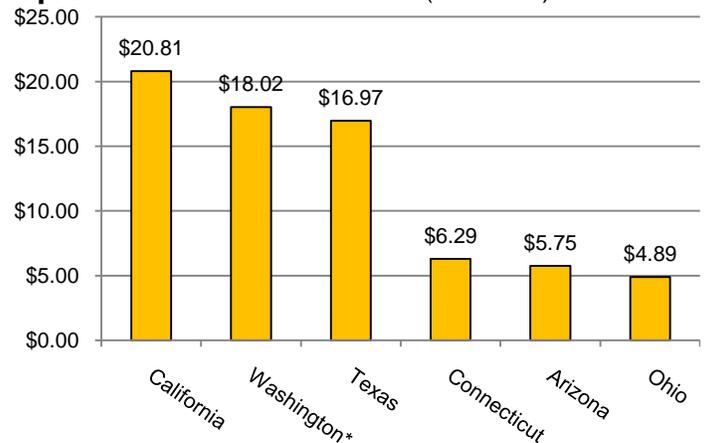
Aircraft Engines

- About 74 percent of aerospace industry employees in Ohio are involved manufacturing engines and parts according to the U.S. Bureau of Labor Statistics.
- Ohio ranked 2nd, after Connecticut, in aircraft engine employment, with nearly 11,800 workers in 2009.
- This industry had 62 business establishments in Ohio, which paid an average annual wage of \$90,596.

Capital Investment Trends

- Annual capital expenditures in Ohio by aerospace manufacturers fluctuated between \$108 and \$352 million during the latest decade for which data are available; expenditures were well within the \$100 and \$200 million range for seven of the 10 years.
- The episodic nature of local investments for such a capital-intensive industry is reflected in the varying portion of national industry investments made here; they ranged from 14.4 percent in 2001 to 3.5 percent in 2009.
- 6.7 percent of industry capital expenditures were made in Ohio during the last decade, a figure greater than the 5.9 percent of industry value added here, and more than twice as large as the percent of industry workers here – indicating that the industry maintains its commitment to manufacturing high value-added products in Ohio.

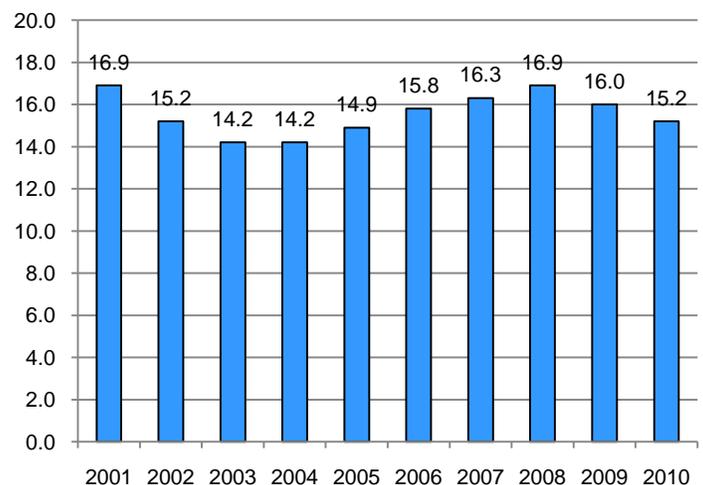
Top States for Value-Added (in billions)



* - year-earlier figure

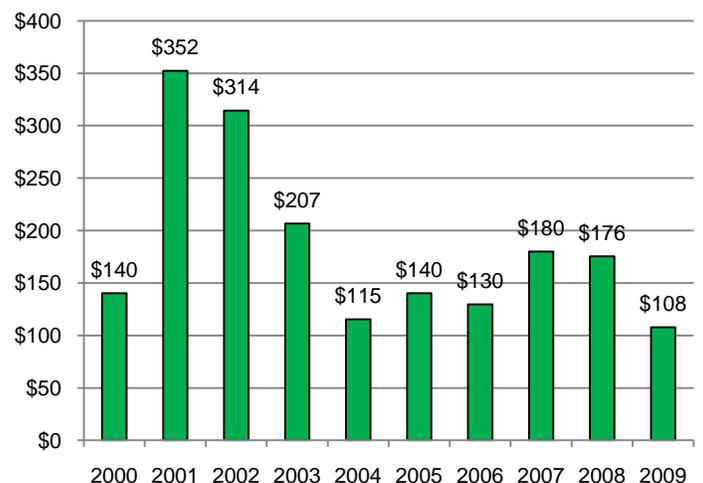
Source: U.S. Census Bureau, 2010

Ohio Employment Trends (in thousands)



Source: U.S. Bureau of Labor Statistics, 2011

Ohio Investment Trends (in millions)



Source: U.S. Census Bureau, 2010

Ohio's defense industry includes companies providing goods and services to the U.S. Dept. of Defense, and the Federal Procurement Data Center collects information on where such work is performed. (Contracts worth less than \$25,000 usually are excluded).

- Ohio's economy benefited from \$6.25 billion in Dept. of Defense procurement spending in fiscal year 2009.
- Ohio provided as much or more in goods and services for the Dept. of Defense than the bordering states of Kentucky, Michigan and West Virginia, and rivaled Indiana.
- The state ranked 18th among the 50 states and the District of Columbia with 1.8 percent of national total in 2009.

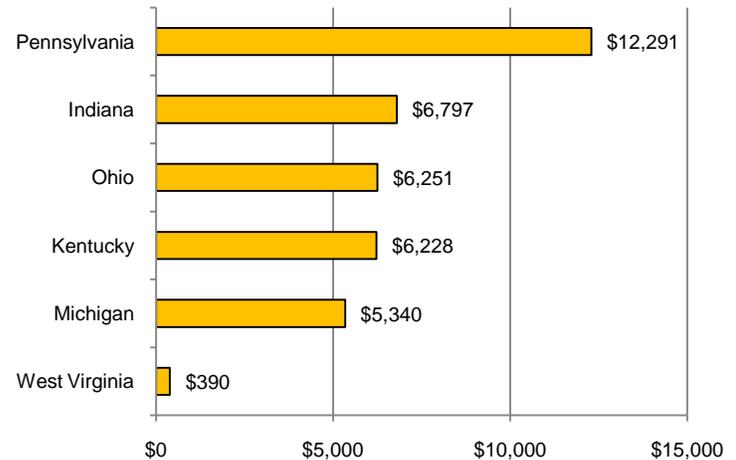
Top Counties

- Four counties accounted for 77.4% of all defense-related work in the state during fiscal year 2009.
- Hamilton, home of GE-Aviation, led all counties in with contract awards exceeding \$2.0 billion – one-third of the state total. Franklin, the headquarters location of Battelle, ranked second with \$1.1 billion in contracts – just over one-sixth of the state total.
- Greene and Montgomery, home to Wright-Patterson Air Force base, combined to receive close to \$1.6 billion – one-fourth of the state total.
- Four more counties – Allen, Cuyahoga, Licking and Summit – combined to provide one-ninth of the goods and services for Defense. General Dynamics (Allen), NASA-Glenn, the Ohio Aerospace Institute and Goodrich (all in Cuyahoga), Boeing (Licking) and Lockheed-Martin (Summit) are some of the notable aerospace and defense operations therein.

Major Projects

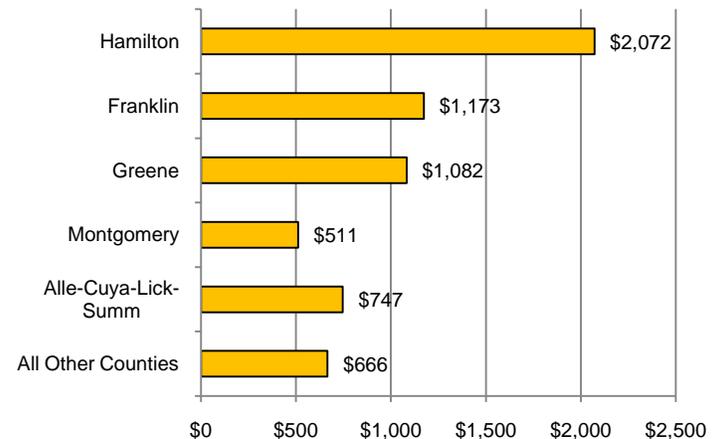
- From 2006 through 2010, 26 companies announced 28 major projects with intentions to invest \$465.4 million, with 2,100 new jobs anticipated at the time. 2008 was the peak year for projects – \$194.1 million, while the largest number of expected jobs – about 960 – was counted in 2009.
- 13 projects totaling almost \$221 million and 770 jobs were for manufacturing aerospace equipment; 8 more projects – \$52 million and well over 1,000 jobs – were for manufacturing other goods for the military; 7 professional service projects – mostly research and development – totaled \$192 million with over 280 jobs.
- GE-Aviation led all investors with \$216 million. Its \$161 million project in 2009 was the largest single announcement. General Dynamics anticipated adding a total of 700 jobs in the five-year time period, but Airborne Maintenance and Engineering made the largest single announcement of new jobs – 430 – in 2009.

Department of Defense Contracts: Ohio and Bordering States (in millions)



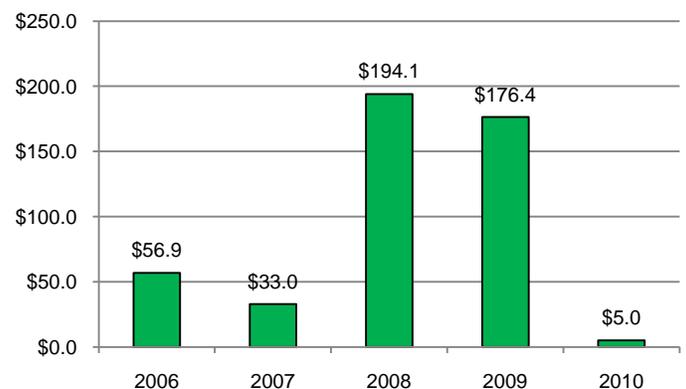
Source: U.S. Census Bureau, 2011

DoD Contracts: Top Counties in Ohio (in millions)



Source: U.S. Census Bureau, 2011

Project Announcements (in millions)



Source: Ohio Dept. of Development, 2011

Wright-Patterson Air Force Base

- Wright-Patterson AFB, located just east of Dayton is large, diverse and organizationally complex. Activities go beyond flight operations to include research and development, advanced education, acquisition and logistics management, and intelligence analysis.
- The conception, testing, acquisition and modernization of the nation's aeronautical weapon systems are directed at the base.
- The base employs over 8,500 military personnel and 12,600 DoD civilian workers. An additional 6,200 non-DoD civilians work there. In 2010, the Air Force estimated that the direct and indirect economic impact of the base amounted to nearly \$5.2 billion per year.

NASA Glenn Research Center

- NASA Glenn is located adjacent to Cleveland Hopkins International Airport. Its primary mission has been – and continues to be – developing science and technology for use in aeronautics and space. The center, along with industry partners, helped develop the liquid hydrogen rocket engine, the Centaur upper stage rocket, the gridded ion thruster (a high-efficiency engine for deep space), and the electrical power system for the space station. The center also grants funds for related small business and educational endeavors.
- The Plum Brook Station subdivision near Sandusky specializes in large-scale tests not suited for the main campus. It includes the world's largest vacuum test chamber.
- The center employs over 1,650 civil servants and 1,850 contract workers – many of the latter are scientists and engineers (see the [local prime contractor list](#)). The most recent economic impact study indicates that the center's presence and direct and indirect impact on the state's economy amounted to over \$1.3 billion.
- Despite the de-funding of the Constellation program, the center continues with research and development in cryogenic fluids management, power and energy storage and conversion, communications, and jet and rocket engine performance.

Ohio Aerospace Institute

- The Ohio Aerospace Institute (OAI) was founded in 1989 as a not-for-profit organization. Its mission is to build Ohio's aerospace economy through research and technology, education and training, and networking and information exchange. OAI has about 80 employees and \$16 million in annual revenue.
- OAI is a joint initiative of the NASA Glenn Research Center, Wright-Patterson's Research Laboratory, the State of Ohio, ten universities in Ohio granting doctoral degrees in aerospace-related engineering disciplines, and many companies engaged in aerospace activities.

The Ohio Center for Advanced Propulsion and Power (OCAPP)

- Led by the Ohio State University and funded as a Wright Center of Innovation under Ohio's Third Frontier Project, OCAPP is a research center that brings together the state's aerospace resources: a strong industrial base, two federal laboratories, and five existing university research programs.
- OCAPP research is providing the knowledge to create faster, quieter, and more fuel efficient jet engines, with reduced environmental impact, to meet the future requirements of aero propulsion systems.

GE – Aviation

- GE – Aviation is a leading producer of a variety of jet engines for commercial and military aircraft. GE also supplies aircraft-derived engines for marine applications and provides aviation services.

Headquarters: Evandale (just north of Cincinnati)
 2007 Revenues: \$16.8 Billion
 Total Worldwide Employment: 39,000
 Operates in more than 50 locations worldwide.

- CFM International, the joint venture with France's SNECMA, also operates in the Cincinnati area. GE - Aviation's Elano and Unison subdivisions are located near Dayton.

General Dynamics Land Systems

- General Dynamics' Land Systems division currently produces the latest model – and upgrades earlier models – of the M1 Abrams tank at the government-owned Joint Systems Manufacturing Center (JSMC) located in Lima.
- More recently, the JSMC also began assembling the U.S. Marine Corp's Expeditionary Fighting Vehicle, which combines amphibious capabilities with high-speed cross-country mobility and crew protection.
- General Dynamics employs at least 700 people at the JSMC; it also has several operations near Wright-Patterson AFB.

Central Ohio Aerospace and Technology Center

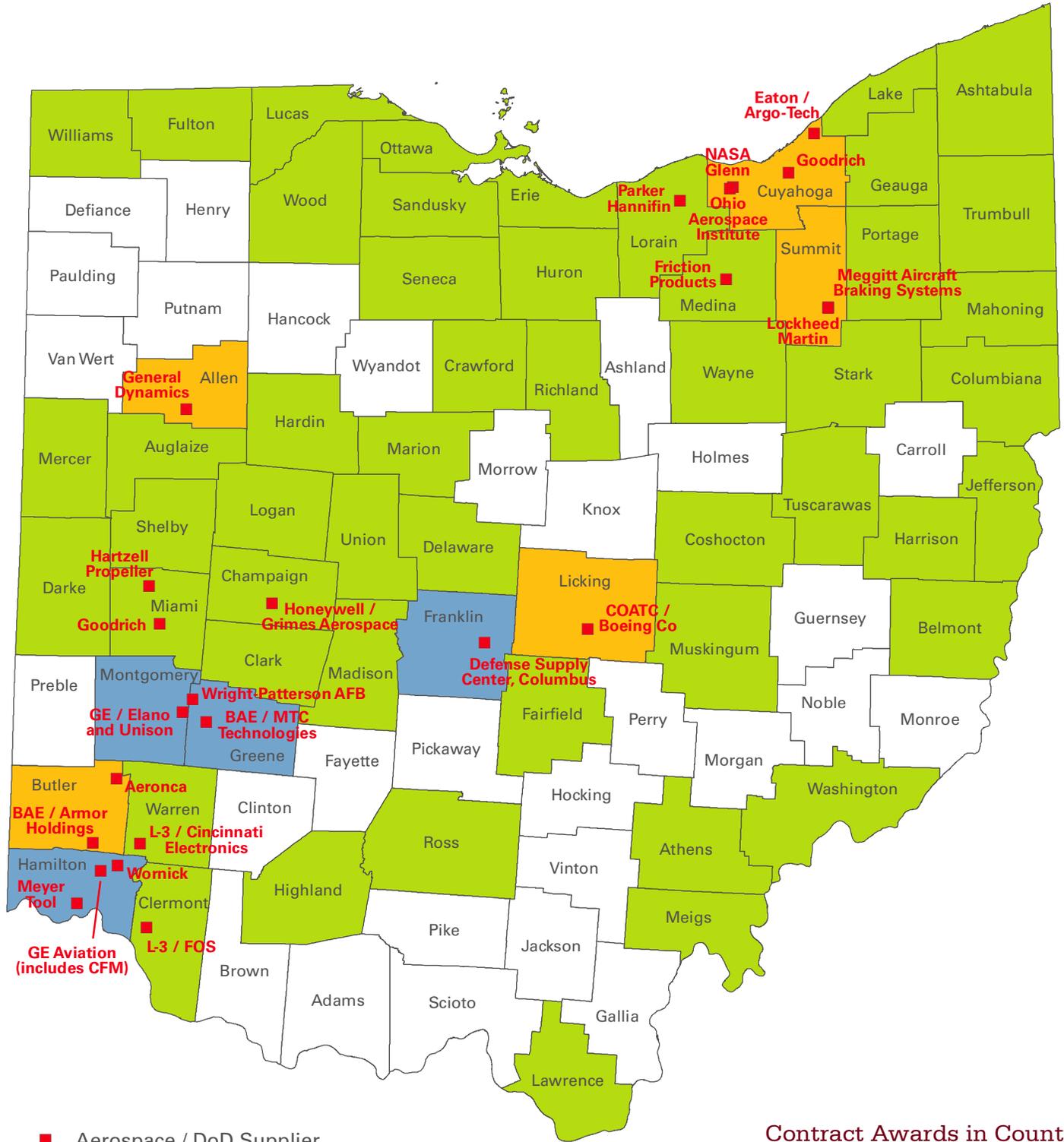
- The center is located in Heath just east of Columbus. Over 860 people work in a number of government and private sector operations.
- The Boeing Guidance Repair Center, the largest tenant, repairs electronics and inertial guidance and navigation systems for the military services. Boeing employs 630 people at this location.

The Defense Supply Center, Columbus, provides logistical support to the military. About 7,000 people worked there in 2008.

Defense Contracts by County and Aerospace / DoD Suppliers



Department of
Development



Source: Consolidated Federal Funds Report: Fiscal Year 2009

Prepared by: Policy Research and Strategic Planning, Ohio Department of Development (May 2011)