

Ohio Aerospace, Aviation, & Defense

2011 Strategic Plan



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Defining Ohio's Growth: Ohio's Strategy for Leadership

Aerospace, Aviation, & Defense offers great opportunities for Ohio business growth.

In 2010, the State of Ohio brought together key Ohio industry leaders to form the Ohio Aerospace and Business Aviation Council. Together we developed a strategy to strengthen and grow Ohio's Aerospace, Aviation, & Defense industry – including its related federal, academic, and non-profit installations and assets.

Completing extensive research, data gathering, and competitive benchmarking, our council defined “Ohio's Right to Win” initiatives that will drive Ohio's economy and increase Ohio's global competitiveness.

These recommendations ensure that Ohio will:

- Protect and strengthen its Aerospace, Aviation, & Defense (AA&D) industry assets against intense competition from other state and nations
- Aggressively leverage and exploit every opportunity to expand, extend, and grow assets to create new jobs and income for Ohioans

We are proud to share the highlights of our learnings and recommendations with you. We hope you will support the growth initiatives defined herein and help us promote the Ohio aerospace story.

Sincerely,

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Jennifer Spohr - Ohio Department of Development
Doug Stewart - Ohio Regional Business Aviation Association
Noah Sudow - Ohio Board of Regents
Lisa Swartzwelder - Business Aviation Collaboration of Ohio

Driving Growth: Ohio's Aerospace Assets

Over 1,200 companies representing over 100,000 Aerospace, Defense, & Aviation jobs in Ohio.



INDUSTRY/COMPANIES (SAMPLE)

AeroControleux
Alcoa
Alphaport
ATK
BAE
BAE Armor
Ball
Battelle
Belcan
Brush Wellman, Inc
Dayton T. Brown
Eaton
Flight Options
GE Aviation
Goodrich Corporation
GrafTech International Ltd.
Honeywell International Inc.
L-3 Communications
Lockheed Martin
Meggitt Aircraft Braking Systems
Moog
NetJets
Northrop Grumman
Parker Hannifin
PCC Airfoils
Pratt & Whitney
Rolls-Royce/LibertyWorks
RTI
SERCO
TAC Americas
Textron
The Boeing Company
The Goodyear Tire & Rubber Company
The Timken Company
Wyle

AIRPORTS

Akron-Canton Airport
Cleveland Hopkins International Airport
Cincinnati/Northern Kentucky International Airport
Columbus Regional Airport Authority
Dayton International Airport
Dayton-Wright Brothers Airport
Toledo Express Airport

AIRPORTS WITH RUNWAYS 8,000 FEET OR LONGER

Airborne Airpark Airport
Cleveland-Hopkins International Airport
James M. Cox Dayton International Airport
Mansfield Lahm Regional Airport
Port Columbus International Airport
Rickenbacker International Airport
Springfield-Beckley Municipal Airport
Toledo Express Airport
Wright-Patterson AFB Airport
Youngstown-Warren Regional Airport

FEDERAL INSTALLATIONS

Air Force Research Laboratory
Air National Guard Bases (Mansfield and Springfield)
Blue Ash ANG
Camp Perry ANG
Cincinnati Defense Fuel Support Point
Mansfield Lahm Airport ANG
NASA Glenn Research Center
NASA Glenn Plumbrook Operations
Rickenbacker IAP (ANG)
Springfield Beckley Municipal Airport
Toledo Express Airport ANG
Wright Patterson Air Force Base (WPAFB)
Youngstown-Warren Regional Airport ARS

INDUSTRY INSTITUTIONS

Air Force Association (AFA)
Armed Forces Communications and Electronics Association (AFCEA)
Aerospace Industries Association (AIA)
American Institute of Aeronautics and Astronautics (AIAA)
Aircraft Owners and Pilots Association (AOPA)
Aerospace States Association (ASA)
Dayton Defense
Dayton Development Coalition (DDC)
Experimental Aircraft Association (EAA)
IT Alliance
Ohio Regional Business Aviation Association (ORBAA)
Ohio Aerospace Institute (OAI)
Ohio Business Development Coaliton (OBDC)
Ohio Department of Development (ODOB)
Society of Flight Test Engineers (SFTE)
TechSolve, Inc - Ohio Edison Center for Aerospace

UNIVERSITY/COLLEGES/TECH SCHOOLS

Air Force Institute of Technology
Bowling Green University
Case Western Reserve
Central State University
Defense Acquisition University
Defense Institute of Security Assistance Management
Kent State University
Miami University
Ohio University
Sinclair Community College
The Ohio State University
University of Akron
University of Cincinnati
University of Dayton
University of Toledo
Wilberforce University
Wright State University

HERITAGE

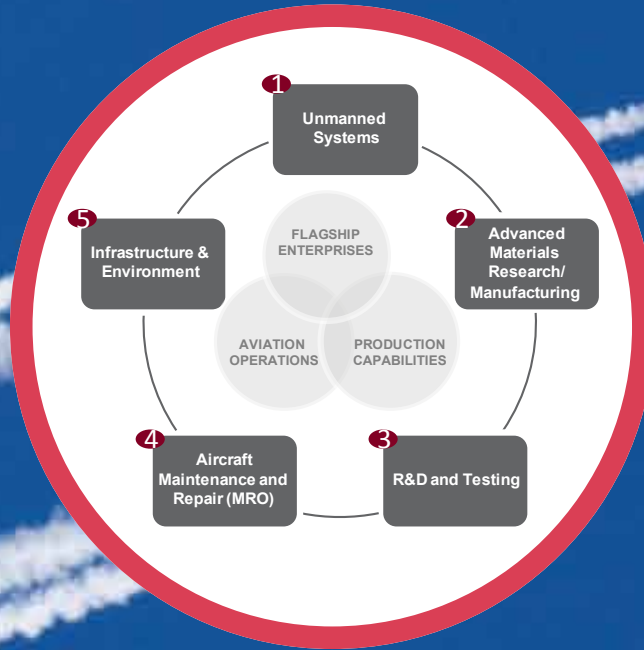
Armstrong Air and Space Museum
Champagne Aviation Museum
Crawford Auto Aviation Museum
Dayton Aviation Heritage National Historical Park
'05 Flyer at Wright Berry Center-Carillon Park
Aviation Trail Parachute Museum
Hawthorn Hill
Huffman Prairie Flying Field
Huffman Prairie Flying Field Interpretive Center
Wright Brothers Memorial
Wright Company Factory
Wright Cycle Company
Wright-Dunbar Interpretive Center and Aviation
Dayton History/Carillon Historical Park
Engineers' Club of Dayton
Crawford Flying Lab Foundation
Historic WACO Field and WACO Airplane Museum
International Women's Air & Space Museum
MAPS Air Museum
Military Aviation Preservation Society
NASA Glenn Visitor Center at Great Lakes Science Center
National Aviation Hall of Fame
National Museum of the United States Air Force
Tri-State Warbird Museum
Woodland Cemetery
Wright B Flyer, Inc.
Wright State University Archives

Access Ohio's cutting edge aero R&D/Testing technologies and optimized production capabilities

Leading the Way: Ohio's Right to Win

Ohio is the undisputed leader in aircraft engine manufacturing & development	<p>30% of US Aircraft engine manufacturing is located in Ohio and the adjacent states of Indiana and Michigan.</p> <p>WPAFB Air Force Research Laboratory's Propulsion Directorate is the Nation's premier source of advanced propulsion technologies for military services.</p>
Ohio offers unmatched military aviation research & development capabilities	<p>Aeronautical Systems Center at WPAFB designs, develops, and delivers dominant aerospace weapon systems and capabilities for US Air Force, other US military, allied, and coalition-partner war fighters</p> <p>AFRL is the Air Force's only organization wholly dedicated to leading the discovery, development, and integration of war fighting technologies for U.S. air, space, and cyberspace forces</p>
Ohio is a leading, global supplier to the world's major aerospace, aviation, & defense oems	<p>#1 US Supplier state to Airbus</p> <p>#2 US Supplier state to Boeing</p> <p>#3 US Supplier state to Northrop Grumman</p> <p>Lockheed is currently building significant presence in Ohio</p>
Ohio offers one of a kind, worldclass test and research & development facilities	<p>Next Gen/Space Systems: Ohio's NASA Glenn Research Center (R&D/Testing) is the world's largest space systems environment and rocket test chambers: Space power, aeronautical test, Plum Brook and other R&D capabilities</p> <p>Aerospace Medicine & Human Performance: Consolidation of USAF School of Aerospace Medicine, Human Effectiveness Directorate, Naval Aerospace Medical Research has created Ohio's Air Force Center of Excellence for Human Performance (1,200 new government positions); NASA Glenn, Cleveland Clinic, Case Western and university hospitals of Cleveland are also engaged in space-related human research and development</p>

Building Ohio Aerospace: Five Core Areas of Focus



The combination of Ohio's Flagship Enterprises, Aviation Operations, and Production Capabilities ensures Ohio's success and growth in these five core areas.

Five Core Areas of Focus

#1: Unmanned Systems (US) - Air, Ground, and Other

Objective

- Expand Ohio's R&D leadership in both commercial and defense applications to become a recognized center for US development and testing

Strategies

- Strengthen Ohio's R&D (military and university assets), unmanned systems assets, and industrial base (private sector)
- Prioritize unmanned systems supply chain/OEM attraction efforts

Primary Initiatives

- Collaborate with FAA to secure controlled airspace for testing for unmanned systems and the development of NextGen Air Traffic Management System, work with NASA Glenn Research Center and FAA on command and control communications (ground-to-vehicle, vehicle-to-vehicle, and satellite-to-vehicle)
- Focus investment on the creation of an Unmanned Systems Cluster/Center of Excellence that fosters the development, integration, testing, and commercialization of sensor, communication, and power systems
- Secure investment in unmanned systems R&D from federal, DoD, private, and state-funded programs (e.g., Third Frontier)



#2: Advanced Materials Research & Manufacturing

Objective

- Leverage and advance Ohio's dominant position in advanced materials R&D

Strategies

- Identify and promote funding for advanced materials research entities (e.g., Air Force Research Laboratory, NASA Glenn Research Center, universities, private industries)
- Incent and promote the transition of scalable advanced materials R&D from the federal labs, universities, and other research organizations to Ohio's private industry/manufacturers and supply chain
- Focus attraction efforts on expanding Ohio's material supply chain

Primary Initiatives

- Increase Third Frontier funding for advanced aerospace material R&D and manufacturing process technologies for industry
- Create an Ohio match to federal funding programs to better leverage federal funds to connect with small companies
- Encourage an Aerospace & Business Aviation Advisory Council outreach network/consortium of Ohio's material development leaders



**Improve your productivity
and profitability with
Ohio's skilled labor and
low-cost supply base**

Five Core Areas of Focus

#3: Research & Development and Testing

Objective

- Maintain and expand Ohio's position as a worldwide leader of cutting edge, one-of-a-kind R&D and testing capabilities

Strategies

- Ensure maintenance and expansion of Ohio's federal labs' R&D and testing to grow their capabilities
- Market Ohio's unique capabilities to aerospace, business aviation, and testing lab service companies
- Promote access and knowledge transfer between flagship entities (Air Force Research Laboratory/NASA Glenn Research Center/universities) and Ohio's existing aerospace supply chain

Primary Initiatives

- Encourage customers to use Ohio R&D/testing facilities in an overall testing services portfolio
- Identify and market all of Ohio's R&D and testing capabilities, including industry and university assets
- Define and remove barriers to accessing federal labs and universities by private industry



#4: Aircraft Maintenance Repair & Overhaul (MRO)

Objective

- Leverage Ohio's aerospace supply network to support the expansion of Ohio's aircraft maintenance, repair, and overhaul (MRO) industry

Strategies

- Focus attraction efforts on expanding Ohio's MRO supply chain and attracting a major airframe/airline MRO
- Create an MRO network

Primary Initiatives

- Complete an analysis of MRO requirements/gaps by aircraft segment
- Create a task force of public and private representatives to better leverage MRO assets and encourage OEM expansion in Ohio
- Promote/incent team to push a networked Ohio MRO offering



Ohio invests over \$100 million dollars annually in R&D projects that will impact the aerospace industry.

Five Core Areas of Focus

#5: Aviation Infrastructure & Environment

Objective

- Maintain and improve Ohio's aviation infrastructure to meet the global requirements of Ohio companies and citizens needing aviation transportation services

Strategies

- Develop efficient airport operations, procedures and logistics (for all segments of aviation) to posture for FAA's Next Generation Air Transport System (NextGen) advancements

Primary Initiatives

- Create a joint industry/multi-university consortium to support research, education, and certification requirements in areas of critical importance to NextGen
- Support the efforts of the existing coalition assembled to create the business plan for the Ohio Center for Business Aviation (the mission is planned to include research, education, and advocacy for the industry)
- Support the "Go OHIO" infrastructure plan that includes:
 - Fund infrastructure improvement as defined in the "Go OHIO" plan
 - Support extension of the Airport Improvement Plan (AIP)
 - Preserve Ohio airspace and airport facilities
 - Invest in and give political support for Ohio airports with NextGen technology upgrades



Emerging Industries: Future Areas to Explore

Several areas of emerging excellence and opportunities were identified that need to be monitored and supported as part of the State's overall technology and emerging industry portfolio:

Aerospace Power Management

Higher payload, more effective propulsion, and lighter aircraft requirements compel commercial and defense systems to find ways to manage power output and consumption. A notable Ohio investment is GE Aviation's recent development of an Electrical Power Integrated Systems Research & Development Center.

Aerospace Sensors Strategy

Continued advances in aerospace sensors are of significant interest for defense and homeland security applications. By virtue of AFRL's Sensor Directorate and NASA Glenn, Ohio leads the nation in sensors research and application for defense and space applications.

Aerospace Human Effectiveness Strategy

Ohio-based 711th Human Performance Wing at Wright Patterson Air Force Base (WPAFB) is a unique combination of three units: the Human Effectiveness Directorate, the USAF School of Aerospace Medicine, and the Human Performance Integration Directorate. The synergies of combining the ideas, resources, and technologies of these units position Ohio as a world leader in the study and advancement of human performance for aerospace.

Aerospace Propulsion

The Aerospace Propulsion industry is the keystone of Ohio aerospace manufacturing.

Ohio's prominent aerospace propulsion assets (GE Aviation, AFRL Propulsion Directorate, etc.) are of critical importance to the future of the industry in Ohio.

Many of the general recommendations and several of the catalytic initiatives, specifically Advanced Materials Research & Manufacturing and R&D and Testing, will benefit Ohio's aerospace propulsion industry.

Commercial Space

Many commercial space companies are contacting Ohio and other states seeking public investment support and locations for operations, as well as space ports. Ohio does have unique test facilities, R&D assets, and manufacturing capability that could serve this growing industry well.

Prospective contributions by Ohio's NASA Glenn Research Center and the Air Force Research Lab may include research, development, test and evaluation of a heavy lift vehicle that is human-rated; upper-stage segments including propulsion, power, and communications systems, composite structures; and reusable rocket engine systems.

Ohio enables you to build a successful business and enjoy a rich, fulfilling personal life.

Implementation for Success: Key Steps

Key Initiatives

The council has defined the strategic initiatives that will drive this plan to success. While primary initiatives are listed herein with additional initiatives have been defined with a longer time horizon. All the initiatives will require support from all current stakeholders at a federal/state, private industry and universities/non-profit entities. Workforce & Education and Marketing initiatives have also been defined.

Workforce and Education

Maintaining Ohio's balance of trained workforce supply and demand for aerospace will be key to our future.

Ohio serves the needs of Ohio employers through continued support of incumbent worker training of existing Ohio companies - making a commitment to making/keeping them globally competitive.

Ohio will continue with efforts to excite Ohio students about Aerospace and STEM to produce enough engineers and technicians to meet the future/competitive market demands.

Marketing Ohio's Aerospace Story

Ohio has a long history of Aerospace innovation and Aviation heritage. Efforts are underway to refine a compelling Ohio Aerospace positioning that articulate a relevant and differentiated Ohio Aerospace Story. All marketing efforts will educate, inspire, and engage Ohio Aerospace leadership; encourage investment in Ohio, and educate to keep Ohio a key priority for federal funding resources.



Key Contributors



Air Force Research Laboratory



Aeronautical Systems Center



Maximize your marketability with Ohio's central location and proximity to world leaders in aerospace and business aviation

