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# Aerospace & Defense Industry in Arizona

An Intellectual Roadmap to Economic  
Development

Seidman Research Institute

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SCHOOL of BUSINESS



# Importance of A&D Industry to Arizona

- \$8.8 Billion in Gross State Product
- \$9.1 Billion economic output from military installations
- 93,800 Private Industry Jobs
- 96,328 jobs generated by military installations
- A&D Salaries 52% higher than average wage in Arizona

# An Intellectual Roadmap for Economic Development of the Aerospace & Defense Industry in Arizona

- Seidman Institute Project Sponsored by SFAz
- <http://www.seidmaninstitute.com>
- Reflects our recent work
  - Commerce Authority
  - Raytheon
  - Boeing

# Products of the Report

- Summarizes the current state of the A&D industry within Arizona;
- Identifies key players and developments that could yield additional growth to the industry;
- Provides an overview of best practice in other states;
- Evaluates the threats, opportunities, weaknesses and strengths of Arizona's A&D industry;
- Identifies a range of strategic choices open to the A&D industry within Arizona today; and
- Recommends a plan to enable the industry to maximize its opportunities while simultaneously minimizing the impact of any weaknesses and protecting itself against threats.

# Roadmap to the future success of the Arizona A&D industry:

- Arizona's A&D industry is currently quite disparate and will benefit from greater collaboration between industry, research and the military;
- This collaboration is ideally best served by the establishment of an Aerospace Institute, facilitating the exchange of ideas and needs between all stakeholders;
- Current core competencies in areas such as national defense, cyber warfare, intelligence and surveillance, special operations, counter terrorism and border security have to become the main focus of future development;
- The Department of Defense is receptive to working outside the confines of Washington, DC. However, to take advantage of this opportunity, Arizona needs much greater support from its congressional delegation;

# Roadmap Cont.

- Arizona's universities must work closely with the business development teams at very large manufacturers such as Boeing and Raytheon to maximize share of the research dollars available, and produce work of value both commercially and militarily;
- Closely aligning the collaborative efforts of research and industry around established themes in A&D, guided by an Aerospace Institute, will enable Arizona to offer the Department of Defense beginning-to-end solutions based on existing and solid competitive advantages;
- Further analysis is required to account for the lack of Second-Tier Suppliers within the State, the impact this has upon the industry, and the optimum strategy to remedy the situation.

# Literature Reviewed

AUTHOR	PUBLICATION
ANGLE Technology Group	<ul style="list-style-type: none"> <li>AZ Aerospace, Defense and Avionics Industries Study (2008)</li> </ul>
Applied Economics	<ul style="list-style-type: none"> <li>Arizona Supply Chain Analysis (2005)</li> </ul>
Arizona Aerospace & Defense Commission	<ul style="list-style-type: none"> <li>Progress Reports (2005) (2006) (2008) (2009)</li> <li>Strategic Plans (2008) (2009) (2010)</li> <li>Variety of Issue Forms submitted to the AADC</li> </ul>
Arizona Arts, Sciences & Technology Academy	<ul style="list-style-type: none"> <li>Astronomy, Planetary Sciences, and Space Sciences Research Opportunities to Advance Arizona's Economic Growth (2007)</li> </ul>
Arizona Commerce Authority	<ul style="list-style-type: none"> <li>Arizona Center of Excellence (2010)</li> </ul>
Arizona Department of Commerce	<ul style="list-style-type: none"> <li>Arizona Military Regional Compatibility Project: Project Update #12 (2007)</li> </ul>
Battelle Technology Partnership Practice	<ul style="list-style-type: none"> <li>Building from a Position of Strength: Arizona Advanced Communications and Information Technology Roadmap (2004)</li> </ul>
The Gold Group	<ul style="list-style-type: none"> <li>Creating an Arizona Aerospace Institute (2008)</li> </ul>
The Maguire Company	<ul style="list-style-type: none"> <li>Economic Impact of Arizona's Principal Military Operations (2008)</li> </ul>
L William Seidman Research Institute (ASU)	<ul style="list-style-type: none"> <li>The Boeing Company – Economic Impact on Arizona (2006) (2010)</li> <li>Economic Impact of the Boeing Led Ground-Based Midcourse Defense Program: Arizona Operations 2007 (2008)</li> <li>Economic Impact of Raytheon Missile Systems (2009)</li> <li>Economic Impact of Aerospace &amp; Defense Firms on the State of Arizona (2010)</li> </ul>

# Alex Castelazo

## Senior Research Associate

# Relevant Themes

- The Business Environment
- The Supply Chain
- Research Competitiveness
- Workforce/STEM Education
- Aerospace Institute

# Interviews

- Vicki Panhuisse
  - Previous Vice President of Commercial & Military Helicopters at Honeywell and Chair of the Arizona Aerospace & Defense Commission;
- Werner Dahm
  - Director of the Security & Defense System Initiative (SDSI) at Arizona State University;
- Mitzi Montoya
  - Executive Dean of the College of Technology & Innovation at Arizona State University;
- Steven Kimmel
  - Senior Vice President, Corporate Development at Alion Science and Technology;
- Dee H. Andrews
  - Technical Director of the Warfighter Training Research Division of the Air Force Research Laboratory in Mesa, AZ.

# Interview Questions

1	What are the linkages in the aerospace & defense system in AZ?
2	What role should government take in the economic development of the A&D industry?
3	What are the major challenges/roadblocks in developing an aerospace institute in AZ?
4	What role should tax incentives play in economic development?
5	What role should industry play?
6	What role should research entities play?
7	What role should the military play?
8	Where is the breakdown in communication between the major players in the industry?
9	What challenges does AZ face in terms of workforce development?
10	Which states do you see as leaders in collaborative initiatives?
11	What are the challenges/opportunities in AZ for commercializing new technologies?
12	What is being done to develop small businesses in the State (SBIR/STTR)?

# Key Messages

1. Small businesses and Entrepreneurs;
2. Established Operations and Competencies;
3. Arizona's Congressional Delegation;
4. An Arizona Aerospace & Defense Institute (ADI);
5. STEM education;
6. Intelligent Strategy;
7. Leverage Strengths.

# TOWS Analysis

	EXTERNAL OPPORTUNITIES (O)	EXTERNAL THREATS (T)
	<ol style="list-style-type: none"><li>1. Building synergies</li><li>2. Border Security research</li><li>3. Increase in UAV research</li><li>4. Value Engineering</li><li>5. Technology Horizons recommendations for new technologies</li><li>6. Greater role of Legal and Policy experts in warfare</li></ol>	<ol style="list-style-type: none"><li>1. Lack of communication between researchers and military</li><li>2. Difficulty transitioning from TRL 6 to TRL 7</li><li>3. Classified domain</li><li>4. Legal and Policy domain not integrated with other research</li><li>5. Competing states</li></ol>

# TOWS Analysis Cont.

<b>INTERNAL WEAKNESSES (W)</b>	<b>MAINTAINING STRATEGIES (WO)</b>	<b>DEFENSIVE STRATEGIES (WT)</b>
<ol style="list-style-type: none"><li>1. Low number of Second-Tier Suppliers</li><li>2. Weak commitment from congressional delegation</li><li>3. Tarnished Image of State</li><li>4. Poor STEM education</li><li>5. Silo mentality of firms</li><li>6. Lack of organized thrust for research</li><li>7. Weak national marketing of advantageous policy</li></ol>	<ul style="list-style-type: none"><li>• Promote value engineering opportunities through VLMs and Second-Tier Suppliers.</li><li>• Mediate between industry and research to remove key roadblocks to collaboration such as IP ownership.</li><li>• Facilitate engagement between firms and suppliers to build synergy in the industry.</li></ul>	<ul style="list-style-type: none"><li>• Protect current assets by supporting unique facilities within the State.</li><li>• Communicate the importance of the A&amp;D industry to the congressional delegation and encourage participation in industry caucuses (i.e., Modeling &amp; Simulation Caucus).</li></ul>

# TOWS Analysis Cont.

## INTERNAL STRENGTHS (S)

1. Restricted Airspace
2. Military bases & testing
3. Military population in State
4. Number of VLMs
5. Civilian aviation facilities  
Excellent Research Entities
6. Unique facilities
7. Intermediary Entities
8. AZ Economic Incentives
9. AZ Commerce Authority
10. Favorable weather

## OFFENSIVE STRATEGIES (SO)

- Focus on core competencies beginning with National Defense, Intelligence & Surveillance and Special Operations, to maintain competitive advantage.
- Leverage airspace and testing ranges to obtain new federal contracts in areas like UAV research and testing.
- Seed Intermediary Entities to assist in collaboration between research and industry.

## MAINTAINING STRATEGIES (ST)

- Strengthen current assets such as military bases, VLMs and unique facilities via collaboration facilitated by intermediaries to prevent threat from lack of communication between entities.
- Facilitate transition from TRL 6 to TRL 7 through collaborative partnerships and intermediary entities.

# Points of Intersection

KEY	
Number of Clusters	Color Code
1	Grey
2	Blue
3	Red
4	Green
5	Orange

Type	Themes	VLM	2nd Tier Suppliers	Research Entities	Unique Facilities	Workforce	Military Bases
TRADITIONAL	National Defense	X		X	X	X	X
	Cyber Warfare	X		X		X	X
	Homeland Security			X	X	X	X
	Intel & Surveillance	X		X	X	X	X
	Special Operations	X	X	X	X	X	X
IRREGULAR	Counter Terrorism		X	X	X	X	X
	International Piracy	X		X	X	X	
	Weapons Trafficking	X		X	X	X	
	Counterfeiting			X	X	X	
	Internal Security			X	X	X	X
EMERGING	Border Security		X	X	X	X	X
	Cargo Inspection			X	X	X	
	Immigration & Control			X	X	X	
	Narcotics Interdiction			X	X	X	
	Cyber Crime	X		X	X	X	
UNDERLYING	Energy and Security			X			
	Religious Extremism			X			
	Legal & Policy Issues			X			
	Global Disparities			X			
	Root Social Causes			X			

# Challenges

- Missing links in supply chain
- STEM Education
- Lack of interaction between industry stakeholders
- Competition from other states

# Strengths

- Restricted Airspace
- Military bases and testing ranges
- Military population in Arizona
- Established Manufacturers
- AZ Economic incentives
- Weather

# Strategies

- Focus on Core Competencies & Established Firms
- Seed intermediary entities to assist with collaboration
- Leverage assets like restricted airspace