



PINAL COUNTY

Innovative Workforce Solutions

Pinal County
Aerospace and Defense
Industry

2020 Asset Inventory

Aerospace and Defense Industry

2021 Asset Inventory

Introduction and Technical Notes

This document inventories the workforce-related assets that support the Aerospace and Defense industry in Pinal County. It estimates both the incumbent workforce and the talent pipeline to provide perspective on the capacity of the region to support an employer from this high-value sector.

The Big Picture-Aerospace and Defense in Arizona

Aerospace and Defense is one of the primary pillars on which Arizona's economy has traditionally been built. Manufacturers of airplanes, helicopters, engines, turbines, aircraft parts and interiors, missiles, satellites, navigation systems, firearms and explosives all call Arizona home. Employment in the *Guided Missile and Space Vehicle Manufacturing* industry is more concentrated in this state than any other, and Arizona ranks #2 among the states for economic activity in the *Aviation Maintenance* sector. Price Waterhouse Cooper recently ranked Arizona a top-10 state for Aerospace and Defense manufacturing attractiveness.

The Arizona Commerce Authority's [*Aerospace and Defense Supply Chain Database*](#) lists more than 350 suppliers who provide products and services to support the Aerospace and Defense industry in Arizona. A number of these suppliers are located in Pinal County, including De Los Santos Construction in Casa Grande, Little Flyers in Kearny, LP Steel in Stanfield, MC Davis in Arizona City and the Mitig Company in Casa Grande. Many dozens more can be found in the nearby communities of Gilbert, Mesa, Marana and Tucson.

The Employers

Aerospace and Defense maintains a significant presence both in and around Pinal County. According to the United States Bureau of Labor Statistics, three firms dedicated to aerospace manufacturing call Pinal County home. Four airports serve the county (the Casa Grande, Ak-Chin, Eloy and Florence Municipal Airports) and the center of Casa Grande is only 42 minutes from Phoenix Sky Harbor, one of the ten busiest airports in the United States, and 75 miles from the Tucson International Airport. Just south of Pinal County is the community of Marana, where Marana Aerospace is internationally recognized as one of the world's most reliable Maintenance, Repair, and Overhaul (MRO) service facilities. These experts in comprehensive full-aircraft care provide heavy maintenance, storage and parking, component repair and overhaul, painting and exterior details, interiors, engineering, FAR 145, and end-of-life solutions at its 2,080-acre facility.

This analysis of the incumbent workforce relies on public labor market data, specifically the United States Bureau of Labor Statistics' *Quarterly Census of Employment and Wages*. To provide the most

targeted and most relevant labor market data possible, much of this analysis aggregates data from Maricopa, Pinal and Pima Counties because even a cursory look at regional travel patterns makes it clear that workers regularly commute to Pinal County manufacturing jobs from communities to the southeast of Phoenix, including Gilbert and Mesa, and the northern communities of Pima County, including Marana and Tucson.

The Incumbent Workforce

More than 30,000 workers in the three counties are directly employed in the narrowly defined *Aerospace Products and Parts Manufacturing* industry, more than triple the number one would expect in a community this size. Average earnings per job in this sector are \$132,815 per year, roughly equivalent to the national average.

The Emerging Workforce

The education and workforce development systems are key to the success of this industry, and this document seeks to quantify the levels of talent emerging from relevant postsecondary programs of study, as well as high school Career and Technical Education (CTE) programs and other non-college training and development programs, as well as targeted efforts of the business community that are contributing to the success of the Aerospace and Defense sector in Pinal County.

Infrastructure and Supply Chain

Finally, the document looks at the distribution of the industry across the region and the proximity of businesses that are typically found in the supply chains of businesses within this sector. It is hoped that this report will provide clear and practical perspective on the resources, partners and infrastructure that could support a regional employer from the Aerospace and Defense sector.

The Employers

Aerospace and Defense has been defined and treated in economic analyses many different ways. This report will leverage the Arizona Commerce Authority’s (ACA) definition of the sector, which involves an expansive set of industry codes with two primary components: manufacturing and services. The ACA defines the sector this way:

The aerospace and defense sector includes businesses that produce or operate airborne vehicles or ground-based military vehicles or ordnance or ammunition. It also includes those that support military or airport operations.

- *Manufacturing – includes businesses that manufacture aircraft, spacecraft, missiles, military vehicles, ordnance and ammunition.*
- *Services – includes businesses that provide air transportation and those that support military or airport operations.*

Employment by Industry

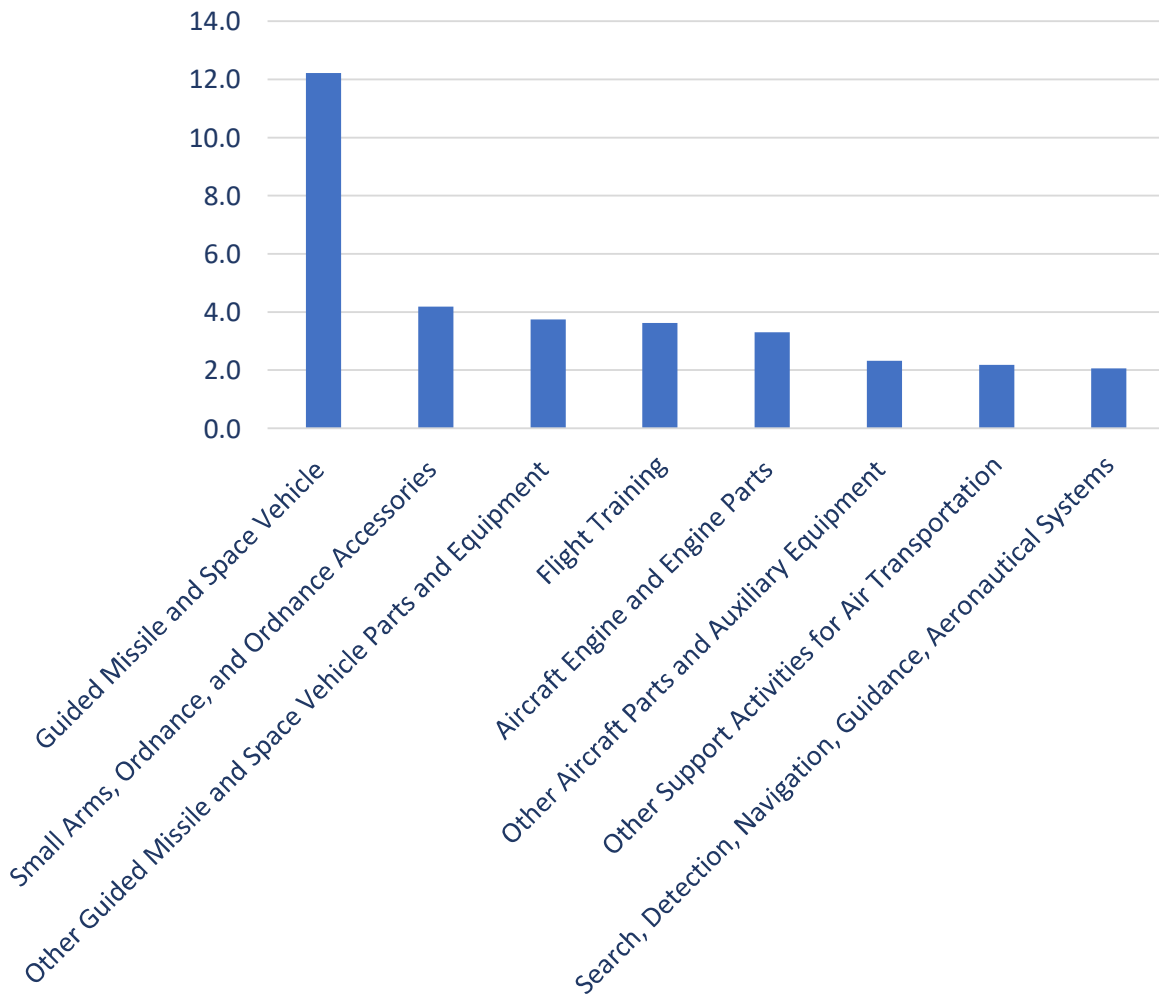
Approximately 36,000 people are employed at the region’s A&D Manufacturing establishments and another 21,000 at A&D services establishments.

Description	2020 Establishments	2020 Jobs	Average Wages
A&D Manufacturing	177	36,424	\$107,538
Guided Missile and Space Vehicle	4	14,506	\$121,644
Aircraft	25	5,367	\$95,506
Aircraft Engine and Engine Parts	36	4,989	\$111,448
Search, Detection, Navigation, Aeronautical Systems and Instruments	30	4,833	\$103,754
Other Aircraft Parts and Auxiliary Equipment	52	4,538	\$81,574
Small Arms, Ordnance, and Ordnance Accessories	22	1,500	\$106,882
Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment	1	479	\$75,631
Military Armored Vehicle, Tank, and Tank Component	3	135	\$81,420
Ammunition (except Small Arms)	3	73	\$63,078
A&D Services	355	21,325	\$70,522
Scheduled Passenger Air Transportation	27	12,206	\$80,175
Other Support Activities for Air Transportation	161	4,673	\$65,033
Other Airport Operations	39	1,794	\$31,927
Flight Training	52	1,325	\$55,622
Nonscheduled Chartered Passenger Air Transportation	45	549	\$75,699
Scheduled Freight Air Transportation	9	370	\$67,729
Nonscheduled Chartered Freight Air Transportation	10	238	\$60,994
Other Nonscheduled Air Transportation	12	163	\$53,793

One method by which the scope of an industry is evaluated is an employment location quotient. This is a scaled value that measures the rate at which the population is employed in a certain industry relative to the national average. If the percentage of the population of the region that works in the target industry is exactly equal to the national average, the location quotient would be 1.0. If it were double the national rate, it would be 2.0.

In Pinal County, a few industries from within the Aerospace and Defense sector are unusually concentrated, employing significantly more than would be expected in a community of this size.

A&D Industries by Location Quotient



Employment by Occupation

The United States Bureau of Labor Statistics, Employment and Training Administration estimates the rates at which occupations are typically employed by each industry. This report aggregates data from the industries that make up the A&D sector to gain perspective on the typical needs of an employer in the sector and estimates the total number of people doing those jobs across all industries. This pool of talent is available to support employers in the A&D sector in Pinal County.

Occupation	% Of Jobs in Industry	Regional Jobs	Pinal County Jobs	Regional Median Earnings
Aerospace and Defense Manufacturing				
Software Developers & Quality Assurance Analysts/Testers	6.3%	32,092	301	\$101,144
Industrial Engineers	5.7%	5,944	99	\$94,894
Miscellaneous Assemblers and Fabricators	3.7%	15,945	287	\$31,236
Inspectors, Testers, Sorters, Samplers, and Weighers	3.7%	7,397	178	\$41,778
Mechanical Engineers	3.6%	5,398	87	\$96,923
Aerospace Engineers	3.2%	1,936	37	\$121,433
Electrical Engineers	3.1%	5,278	82	\$92,948
Aircraft Mechanics and Service Technicians	3.1%	4,275	46	\$67,708
Machinists	2.5%	4,015	52	\$48,091
Buyers and Purchasing Agents	2.4%	7,982	205	\$65,763
Other Project Management & Operations Specialists	2.2%	23,992	536	\$77,890
Aircraft Structure, Surfaces, Rigging, & Systems Assemblers	2.1%	863	N/A	\$45,000
Aerospace and Defense Services				
Flight Attendants	18.3%	3,952	N/A	\$62,513
Aircraft Mechanics and Service Technicians	10.9%	4,275	46	\$67,708
Reservation/Transportation Ticket Agents and Travel Clerks	9.8%	3,107	18	\$39,584
Laborers and Freight, Stock, and Material Movers, Hand	8.8%	53,628	995	\$30,591
Airline Pilots, Copilots, and Flight Engineers	8.5%	1,957	10	\$128,339
Customer Service Representatives	4.7%	97,823	1,262	\$35,562
Cargo and Freight Agents	2.1%	1,506	17	\$41,046
Commercial Pilots	1.8%	839	22	\$80,203

Employers who have posted large numbers of openings for these jobs in recent years include:

- Boeing
- Nammo Talley
- Sierra Nevada Corporation
- BAE Systems
- Aerovironment, Inc
- Signature Air Support
- Atlas Air
- The Airline Academy
- Allegiant Travel
- Heico Corporation

The Supply Chain

Physical proximity to the supply chain on which a business relies is more important in some industries than others. For example, manufacturers often incur high costs when raw materials must be transported across significant distances. This may not be as important a factor in the health care sector, but the industries which most often support a business in the Aerospace and Defense sector can definitely be found in abundance in Pinal County.

Description	In-Region Purchases	% In-Region Purchases	Establishments	Location Quotient
Aircraft Engine and Engine Parts Mfg	\$962,288,472	99.3%	10	.17
Guided Missile and Space Vehicle Mfg	\$585,289,553	99.6%	49	1.1
Other Aircraft Parts & Auxiliary Equipment Mfg	\$352,999,879	85.8%	23	.5
Aircraft Mfg	\$209,150,304	93.2%	1	1.11
Corporate, Subsidiary, and Regional Managing Offices	\$130,716,968	44.9%	10	.2
Missile/Space Vehicle Propulsion Systems Mfg	\$130,607,196	46.5%	24	.5
Search, Detection, Navigation, Aeronautical Systems Mfg	\$125,385,567	45.2%	47	.5
Semiconductor and Related Device Mfg	\$108,421,923	99.4%	72	1.8
Other Guided Missile/Space Vehicle Auxiliary Equip Mfg	\$71,960,494	42.6%	32	.4

The Talent Pipeline

Postsecondary Education

Thirteen institutions of higher learning are in the proximity of Pinal County, and five of them offer *Precision Production* or *Mechanic and Repair Technologies* programs.

Table 4: Awards, Precision Production and Mechanic/Repair Programs, by Institution, 2019

Institution	All Programs		Precision Production Programs		Mechanic and Repair Technologies		Engineering and Engineering Technologies	
	Certificates Below a Bachelor's Degree	Associate's Degree	Certificates Below a Bachelor's Degree	Associate's Degree	Certificates Below a Bachelor's Degree	Associate's Degree	Certificates Below a Bachelor's Degree	Associate's Degree
Central Arizona College	804	523	36	5	1	6	31	2
Chandler-Gilbert Community College	1,395	1,271	-	-	186	9	-	20
Mesa Community College	2,230	2,131	40	8	73	29	17	19
Pima Community College	3,005	2,257	21	25	337	41	68	18
Eastern Arizona College	799	551	14	4	216	20	16	14

*National Center for Education Statistics
Integrated Postsecondary Educational Data System*

Central Arizona College Industrial Technology and Skilled Trades Program

Central Arizona College offers eleven certificates in its ITST program:

- Advanced Structural Welding and Fabrication
- Automated Industrial Technology I
- Automated Industrial Technology II
- Commercial Electrician-Installer
- Diesel Technology I
- Diesel Technology II
- Fundamentals of Pipe Welding
- Fundamentals of Structural Welding
- Heavy Equipment Operator Level I
- Heavy Equipment Operator Level II
- Pipefitting/Pipe Welding

The Central Arizona Vocational Institute of Technology

CAVIT is a part of a network of 14 Career Technical Education Districts (CTEDs) across the state. High school students in the 11th and 12th grades may attend CAVIT central campus programs and receive high school and dual enrollment credits while enrolled in CAVIT classes. Career technology education prepares students to enter the workforce immediately after graduation or to pursue further education at a community college or university.¹

What do Pinal County high school students learn about industrial technology?

CAVIT Automated Industrial Technology Program

Program Highlights

- Invent, design, and produce solutions for complex engineering challenges using mathematics, science, and technology.
- Maintain, troubleshoot, and repair motor controls, programmable logic controllers, and power fluid systems.
- Problem-solve with advanced electrical and fluid power diagnostic equipment

Program Length

The automated industrial technology program is two years in length. Students have the opportunity to obtain NCCER production technician industry certification, as well as, OSHA 10-hour general industry and CPR instruction.

Students successfully completing the program have the opportunity to earn free dual enrollment college credit providing all requirements are met.

Instructional Topics

- CNC Interfacing
- Data Communications
- Drafting
- Ethics of Robotics
- Electrical Systems
- Industrial Safety
- Industrial Robotic Tasks
- Laboratory Equipment
- Maintenance Operations
- Mechanical Systems
- Pneumatic Systems
- Process Control Systems
- Robotic Assemblies

¹ https://www.cavitschools.com/About_Us

The Pima Joint Technical Education District

The Pima JTED Career and Technical Education District offers premier, tuition-free CTE programs to sophomores, juniors and seniors in Pima County.

What do Pima County high school students learn about industrial technology?

CAVIT Aviation Technology Program

Program Highlights

Learn aircraft general mechanics, maintenance, blueprint reading, motion dynamics, electrical systems, aircraft weight and balance, aviation safety, and FAA regulation requirements. These courses are part of the preparation for Airframe and Powerplant certification testing. * Additional Aviation course work is required for the A&P certifications.

Certification

- General Aviation Mechanics
- Airframe and Powerplant

CAVIT Air Transportation/FAA Drone Operator

Gain the technical knowledge and skills to safely fly and navigate aircraft. Learn the principles of aircraft design and performance, aircraft flight systems and controls, flight crew operations and procedures, radio communications, navigation procedures and systems, airways safety and traffic regulations, and governmental rules and regulations pertaining to piloting aircraft.

Certification:

- FAA Remote Pilot Certificate (Drone Pilot)
- FAA Ground School
- FAA Ground Instruction Basic

Direct Employment:

- Drone Operator
- Pilot Instructor

Engineering – Aerospace and Mining Technology

Prepare to apply basic engineering principles and technical skills in support of engineers engaged in a wide variety of projects. Instruction will be problem-based with a special focus on aerospace technology, mining technology, alternative energy, and power systems including solar. Additional topics include computer-aided design, electronics, hydraulics, mechanical drawing, robotics, and precision measurement.

Certification

State and/or nationally recognized industry certification will be available

- Direct Employment:
- Engineering Technician
- Manufacturing Equipment Technician
- CAD Technician

Job Leads To

- Mechanical Engineer
- Engineering Technologist
- Electrical Engineer

Pima Community College Aviation Technology Program

Pima Community College offers a range of programs, including pre-engineering, mechanical drafting and precision production programs, and also offers certificate programs for Aircraft Powerplant Mechanics, Aircraft Structural Repair, Avionics Technicians and Aircraft Airframe Mechanics.

The college also offers the Aviation Technology Program of Study. The program's Airframe and Powerplant courses are approved by the Federal Aviation Administration and run year-round. It is one of a handful of programs where students conduct hands-on learning on commercial transport aircraft.

The Airframe and Powerplant courses are taught per the FAA's Federal Aviation Regulations Part 147 for FAA Aviation Maintenance Technician schools. This allows students to be qualified for FAA Airframe and Powerplant certification. Aviation Structural Repair does not fall under FAA Part 147 guidelines, but rather follows an industry-directed curriculum teaching students to perform heavy structural repairs.



Appendix One: Job Postings, Maricopa, Pima and Pinal Counties, July 2020 – June 2021

Employer	Unique Postings	Employer, continued	Unique Postings
Boeing	779	Piedmont Airlines, Inc.	37
Cummins Inc.	229	Barnes Group Inc.	36
American Airlines Group Inc.	219	Allegiant Travel Company	36
Lockheed Martin Corporation	174	Sierra Nevada Corporation	31
MD Helicopters, Inc.	140	Marresearch GMBH	27
Mesa Airlines, Inc.	140	Landmark Fbo, LLC	25
Phi, Inc.	121	Delta Air Lines	24
L3 Harris Technologies	120	The Airline Academy Inc	23
Atlas Air, Inc	103	Prospect Airport Services, Inc.	22
Peraton	99	Cirrus Design Corporation	21
Axon Enterprise, Inc.	99	Northstar Aerospace (chicago) Inc	19
BAE Systems PLC	93	Cessna Aircraft Company	18
Caliber Company	92	Exotic Metals Forming Company LLC	17
Textron Inc.	85	Robertson Fuel Systems, L.L.C.	17
General Electric Company	83	Phoenix Mesa Gateway Airport Authority	16
Swissport Usa, Inc.	73	Alliant Techsystems Operations LLC	15
Hawaiian Holdings Inc	71	Northstar Machine & Tool Company, Inc.	15
Sargent Aerospace Inc	70	Flightsafety International Inc.	14
Chromalloy Gas Turbine LLC	67	General Atomics	13
Signature Flight Support Corporation	62	Orthoscan, Inc.	12
Heico Corporation	56	Airport Terminal Services Inc	12
Chipton-Ross, Inc.	56	Powill Manufacturing & Engineering, Inc.	11
Tpi Composites, Inc.	51	Acme Aerospace, Ltd.	11
United Technologies Corporation	50	Jet Aircraft Maintenance, Inc.	10
Skywest, Inc.	46	Global Aviation Services, LLC	10