

SOARING DEMAND: Meeting Talent Needs in the Aerospace Sector



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INTRODUCTION

With global air travel at record levels, there is an expected demand for more than 35,000 new aircraft between 2013 and 2032.¹ This growth poses opportunities and threats for U.S. aerospace manufacturers to keep up with the innovation and expansion of the field.

The aerospace sector is also undergoing a rapid transformation based on unprecedented industry disruptors. These include the growth of green technologies that bring about increased fuel efficiency, composite manufacturing, automation, increased demand for wireless communications and avionics systems, and the need for improved cybersecurity. These trends are compounded by an ever-growing talent need because of retirements and attrition. Skills shortages exist and are expected to remain across the sector, from aerospace engineers to technicians and mechanics. The talent gap facing aerospace reflects a trend in the manufacturing sector at large, which is on track to see 2 million jobs go unfilled in the next decade.²

As with other sub-sectors of manufacturing, the aerospace field is struggling to attract young people and retain existing workers. Companies are finding success through a grow-your-own approach to recruitment and training, and by partnering with schools, community-based organizations, and public agencies to build a pipeline.

This project leveraged partnerships in three areas with a strong concentration of aerospace manufacturers to identify and support pathways into aerospace careers. El Camino College in Southern California, Ivy Tech Community College in Indiana, and the Manufacturing Advocacy and Growth Network (MAGNET) in Northeast Ohio defined regional career pathways in aerospace and ensured these pathways align to the needs of industry. Over a period of 18 months, these partners have taken steps to understand the unique skill needs and market pressures of the aerospace industry.

Working with local industry leaders, each of the three regional partners undertook the following steps to begin resolving the skill gap in its region:

- **Understanding skill needs of the industry** through job profiling and the creation of competency lists.
- **Mapping education to skill needs** by updating curriculum to align with industry recognized credentials and developing short-term certificates that provide training in the precise skills industry demands.
- **Guiding policy changes to support the changing landscape of aerospace careers** by encouraging policy makers to recognize certifications and credentialing, and revisiting the ways organizations and institutions measure completion.

¹ Pricewaterhouse Coopers (PwC), 2013, "Aviation's second golden age: Can the US aircraft industry maintain leadership?"

² Deloitte and The Manufacturing Institute, "The Skills Gap in US Manufacturing 2015 and Beyond"

THE AEROSPACE CAREER PATHWAYS PROJECT

The Manufacturing Institute, with support from Arconic Foundation, embarked on a three-year, multistate project to analyze occupations and map career pathways critical to the aerospace sector. Key regions in Northeast Ohio, Southern California, and Mid-North Central Indiana are microcosms of the diverse needs of aerospace manufacturing. Exploring the needs of small, medium, and large-sized manufactures across the three regions revealed patterns in the occupational priorities and skills needed to meet regional demand.

Initial explorations into labor market demand led the partners to focus on four common, in-demand occupation groups: Industrial Maintenance; Machine Tool Operations, CNC Operations and Aerospace Assembly. Each of these occupations is projected to have strong growth over a 10-year period.

Occupation*	2015 Jobs	2025 Jobs	10-Year Change #	%	Median Hourly Earnings
Industrial Maintenance	2,076,920	2,319,962	243,042	11.7%	\$18.71
Machine Tool Operations	642,385	680,548	38,163	5.9%	\$19.29
CNC Operations	175,832	206,022	30,190	17.2%	\$18.66
Aerospace Assembly	40,524	46,890	6,366	15.7%	\$23.92

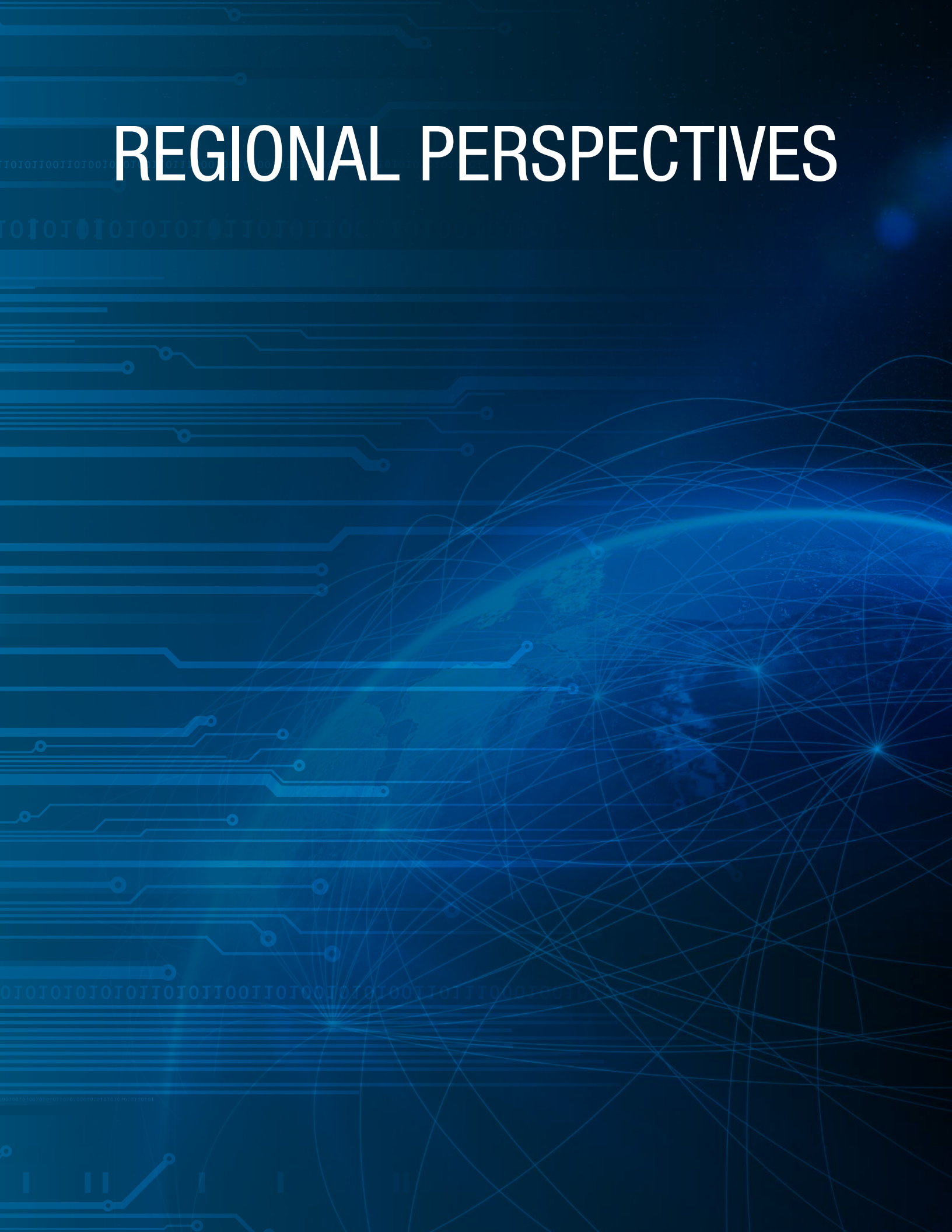
* Source: EMSI 2016.2. Appendix lists the specific 5-digit SOC occupations included in this analysis.

In addition, each region selected one or more regionally important occupations to review:

- In Northeast Ohio (MAGNET Region) – Quality Inspector
- In Central & Mid-North Central Indiana (Ivy Tech Region) – Aircraft Maintenance
- In Los Angeles/Orange County (El Camino Region) – Quality Control Inspector and CAD CAM Programmer

The partners' regional work in defining the career pathways in aerospace manufacturing occupations helped to develop a common framework of competencies and certifications within aerospace. The project has helped manufacturers within the three regions unite around education pathways to streamline the flow of individuals into aviation careers.

REGIONAL PERSPECTIVES

The background is a deep blue gradient. It features a stylized globe in the center-right, with a network of thin, glowing white lines connecting various points across its surface, suggesting global connectivity. To the left of the globe, there are several horizontal, circuit-like lines with small circles at their ends, resembling a printed circuit board. Faint, horizontal bands of binary code (0s and 1s) are visible in the upper and lower portions of the image, adding to the technological theme.



NORTHEAST OHIO – THE MANUFACTURING ADVOCACY AND GROWTH NETWORK (MAGNET)

Mapping competencies to aerospace careers

KEY AEROSPACE OCCUPATIONS

Assemblers/Fabricators, CNC Machinists, Quality Inspector/Technician, Industrial Maintenance, and Tool and Die Maker

CRITICAL ASSETS

The aerospace supply chain retains a strong presence in the state. Facts about Ohio include:

- 1st ranked U.S. supplier state to Boeing and Airbus
- 1st Industry size ranking for 2015 (PwC)
- 3rd Aerospace Manufacturing Attractiveness Ranking 2015 (PwC)
- 26,521 Aerospace workforce (private)
- 528 Aviation and Aerospace firms³

CHALLENGES

Over the past few years, MAGNET has worked with many manufacturers to address workforce and talent needs. One of the common challenges has been the lack of adequate job descriptions that clearly define the knowledge and skill needs for the position. This coupled with the changing workplace demands have increased the potential of miscommunication and disconnect between employers, job seekers, and training providers.

The project highlighted a significant mismatch between the needs of aerospace manufacturers and the locations of college programs best suited to fill the void.

APPROACH

MAGNET reviewed data on the aerospace industry in Northeast Ohio, including reports from the Workforce Intelligence Network on the Lightweight Technology Workforce Supply-Demand.

³ Source: TeamNEO

MAGNET facilitated job profiling and occupational task analysis with regional manufacturers, including aerospace suppliers, to identify performance outcomes for training to prepare individuals for regional in-demand positions. Occupational profile lists were developed using the WorkKeys® assessment, employer interviews and enhanced job analysis activities. Occupational job task lists were used as the foundation for developing an asset map of the region to identify existing pathways and programs to prepare individuals for the in-demand positions.

Armed with the occupational profiles and skill requirements, MAGNET approached four regional community colleges to ask them to review the list of occupational job tasks and match their programs of study and learning outcomes to the tasks. This comparison found that all of the colleges have the core capacity to deliver the knowledge and skills required for the job tasks with machining programs reflecting the highest regional supply. However, the assembler position has unique skill requirements that are not typically offered in current programs of study. In Northeast Ohio, regional community colleges are well positioned to address the current and emerging workforce needs of the aerospace supply chain.

OUTCOMES

The following table is a snapshot of Fall 2016 course completion figures in the program areas providing training for the in-demand aerospace pathways.

	Lorain County Community College	Lakeland Community College	Stark State College	Cuyahoga Community College
Aerospace Assembly & Industrial Maintenance Programs:				
<i>AIT***</i>			86	51
<i>Elec. Maintenance Tech</i>	190	25	30	65
<i>Elec/Electronic Engr.</i>	49	93	78	158
<i>Mechanical Engr.</i>	13	45	122	204
CNC Machining:	35	71	20	
<i>Fast Track Training</i>	5			16
<i>Prec. Machining</i>				52
Quality Inspector*		Offered in CAD		
Tool & Die**		Offered in CAD & Mech Engr		

*All of the colleges have Quality Inspector or Technician programs. However, enrollment has been very low in these programs over the past couple of years. Employer interest is emerging in this career path and the colleges have indicated a willingness to offer a certificate or degree pathway if companies have positions to fill.

**Typically, the schools are delivering tool and die training as part of an apprenticeship pathway. The initial courses are offered as part of a machining and/or industrial maintenance program and are included in other in-demand pathways. The knowledge and skills acquired there prepare individuals for on-the-job training and apprenticeship pathways

***Beginning July 1, 2017, the Stark State College (SSC) AIT (Applied Industrial Technology) program will be broken down into two majors Advanced Manufacturing Technology & Industrial Maintenance Technology under the Industrial Technology program.

INDUSTRY CREDENTIALS

All of the colleges offer some industry certifications through the programs of study. The most common is the National Institute for Metalworking Skills (NIMS) as noted below. The Manufacturing Skills Standards Council (MSSC) Certified Production Technician is available at Cuyahoga Community College (Tri-C) and Lorain County Community College (LCCC) but is not in high demand at the present time. All four colleges offer credentials provided by the American Welding Society (AWS) for welding skill mastery. As the colleges proceed to adapt their delivery formats to meet employer needs, these credentials will be offered as part of the completion measures.

NIMS CREDENTIALS AWARDED IN 2016	
LCCC	22
Tri-C	30
SSC	63

PRACTICAL APPLICATION

The occupational job task lists offer a way for colleges to work with individual and groups of employers to more clearly identify skill needs and adapt programs if needed to address gaps in existing programming. This also saves local employers time and money. As one MAGNET industry partner explained,

In business, training costs are very significant. Companies can lose in two ways. Trainers are usually seasoned associates and subject matter experts, their loss of production time during training coupled with the costs of paying a non-productive trainee can be costly to the company.

Finding people to work in the company who are acclimated to the culture and prepared with the necessary skills, takes away the burden from the company and saves on the bottom line. The fast track training program designed to target our specific talent needs resulted in candidates who were able to successfully participate in an internship leading to full time employment. Working with the community college ensured that the students were on a pathway leading to additional skills, credentials, and degrees.

*Gary Miller
Director of Training and Occupational Development
Kyocera SGS Precision Tools, Inc.*

The work completed in this project provides stakeholders (companies, economic development groups, educators) with information regarding the capacity of the educational institutions and the region to meet current and future workforce demands in the aerospace supply chain. The processes used here can be replicated by employers, educators, and workforce intermediaries to develop career pathways and programs that are responsive to workforce needs and can demonstrate the ability of the region to attract, retain, and grow the aerospace supply chain.



CENTRAL & MID-NORTH CENTRAL INDIANA – IVY TECH COMMUNITY COLLEGE

Employer focused curriculum/program development
with a focus on credentialing

KEY AEROSPACE OCCUPATIONS

Aerospace Assembly, Industrial Maintenance, CNC Operations, Machine Tool Operations, and Aviation Maintenance

CRITICAL ASSETS

Indiana has the right location and resources for aerospace companies to innovate and grow. As the home to several global giants in the aerospace industry, Indiana is leading the charge toward breakthroughs in advanced materials and components that are opening up new possibilities for what we can build and where we can go in the 21st century.

Indiana boasts several major employers, including GE Aviation's engine manufacturing facility, the largest manufacturing facility for Rolls-Royce civil aero jet engines outside the U.K., and recent expansions from Raytheon and Arconic, just to name a few. Key employers/facilities include:

GE Aviation – In 2014, announced company's plans to locate a new \$100 million jet engine assembly facility, creating up to 200 new jobs by 2020.

Arconic – In 2014, announced the company's plans to expand its operations in La Porte, creating up to 329 new jobs by 2019. Also in 2014, the company announced the opening of the world's largest aluminum-lithium plant in Lafayette, Indiana, where it produces advanced, third-generation aluminum-lithium alloys for the aerospace industry.

Rolls Royce – With lower business costs and regulations, one of the most productive steel regions in the world, and solidly placed near the logistical center of the United States, the company selected Indiana for its \$42 million advanced manufacturing facility to produce the next generation of jet engine components for the global market.

Applied Composites Engineering – Constant investments into research and development, new processes, equipment, technologies and personnel continue to bring ACE to the forefront of advanced composites product manufacturing.

CHALLENGES

As the economy in Indiana has improved, and unemployment figures have continued to drop, building the pipeline of students interested in manufacturing related program of study, including aviation-sector occupations, continues to be more and more of a factor. Although overall enrollments in programs of interest that lead to the aerospace career pathways has increased, it is still falling below mandated thresholds. This factor, coupled with dwindling regional budget has set the program back significantly.

APPROACH

The Manufacturing Institute hosted *Work Forward*, a talent forum in Lafayette in August 2016. The event helped to launch, expand, or align several projects aimed at aerospace careers. Several programs have been targets to address or expand, as laid out below.

SURFACE COATINGS

A Surface Coatings Technician Certificate is in development, in conjunction with Praxair Surface Technologies in Indianapolis. The structure of the curriculum has been approved by the Indiana Commission of Higher Education. Work has begun to make the program operational in Indianapolis along with pursuing Federal Financial Aid.

The Indiana Commission of Higher Education has approved the certificate (CT) and Technical Certificate (TC) in Materials Technology. The program will focus heavily on materials of all types, but have special emphasis in Composites and Ceramics. The degree will be a good fit for Aerospace and defense companies. The program has also now moved on to the Department Of Education for financial aid consideration.

New data on enrollment for the summer term in the target programs of study was obtained for the target regions. Dedicated program planning has begun for the Industrial Coatings and Surface Finish Certificate program in Indianapolis. The rollout of the program is slated for August 3 with a launch event in Indianapolis. On August 7, a community event will take place in order to work with the Indiana Manufacturers Association and local media in order to raise awareness of the program and generate enrollments.

APPLIED ASSOCIATE DEGREES

In May 2017, Ivy Tech met with Purdue University to pursue partnerships with the Purdue Polytechnic College. Ivy Tech and Purdue will partner to articulate specific programs in Electrical Engineering Technology, Mechanical Engineering Technology, Engineering Technology, and Computer Graphics. A new proposal structure has been modeled that would allow Associate of Applied Science degree structures to transfer to Purdue into Organizational Leadership. This new proposal is based on a blocked credit format which accepts the Associate of Applied Science degree as is and further builds on that structure within the Bachelor's degree at Purdue to produce technical managers/supervisors. This is a dramatic step forward for both institutions and will greatly benefit students in several ways. The open pool of students is much larger for the AAS degree structures than the AS transfer degree structures which could boost enrollments. Second, industry is wanting this type of arrangement between the Schools in order to meet demand for these positions.

EARN AND LEARN MODEL

Leigh Sargent, owner of Applied Composites Engineering (ACE) approached the Ivy Tech staff about working together on building the pipeline of workers with skills in aviation manufacturing, assembly and composites, as well as possibly developing an apprenticeship program. A combined team of academic, apprenticeship, and engagement staff met with ACE to discuss the Integrated Composite Education (ICE) model. ICE is a work and learn model in which the student takes a semester of Assembly Mechanic coursework, one semester of internship at the participating employer's facility, then takes a final semester of Assembly Mechanic coursework, with the potential for permanent employment following. Students participating in the ICE program will be offered internship and employment opportunities at ACE. In spring 2017 Ivy Tech's Indianapolis campus made the decision to suspend the Aviation Manufacturing program due to lack of enrollment and budget reductions. State legislation now measures enrollment on a minimum number of 30 students. Although the program has increased enrollment from 12 to 20 students, it still has fallen below the 30-student threshold.

The solution to continuing the program is that it will be moved under a different associate degree umbrella - Industrial Technology – with a startup scheduled for spring 2018 semester.

DIGITAL MANUFACTURING

Ivy Tech and Purdue continue to partner in Digital Manufacturing which is a rapidly developing field related to computer graphics, Product Life Cycle Management, Additive Manufacturing, digital networking and security.

Ivy Tech was granted \$100,000 by the Arconic Foundation to partner on Digital Manufacturing and increase additive manufacturing processes in Design Technology coursework.

PROJECT OUTCOMES THROUGH MAY 2017

Training Outcomes	Students In Training:	Students Continued Training:	Students Earned Certificate:
Aerospace Assembly	1	0	0
Industrial Maintenance	222	68	15
CNC Operations	0	0	1
Machine Tool Operations	26	12	23
Aviation Maintenance	6	6	0

Through May 2017, 11 of the industrial maintenance students, one CNC operations student, and 21 machine tool operations students had entered employment.



LOS ANGELES/ORANGE COUNTY, CALIFORNIA – EL CAMINO COLLEGE

Growing the pipeline through partnership with the K-12 system and recruiting underrepresented populations.

KEY AEROSPACE OCCUPATIONS

Aerospace Assembly, Industrial Maintenance, CNC/Machine Tool Operations, and Welding

In an effort to build the pipeline of students entering aerospace manufacturing programs of study in Southern California, El Camino College has developed unique partnerships and sponsorship opportunities to market aerospace and related advanced manufacturing programs to the local K-12 education system and underrepresented populations.

CRITICAL ASSETS

California leads the nation in aerospace production and ranks second in aerospace talent, according to PwC's 2013 report, *Aviation's Second Golden Age*. A study conducted by the California Community Colleges Chancellor's Office Economic and Workforce Development Program – Centers of Excellence (COE) projects that there will be close to 100,000 jobs in aerospace manufacturing in Los Angeles and Orange County by 2018. This represents a little over 60 percent of the projected employment for the State of California in this sector. In fact, some argue that this number is understated because many employers are filling positions with temporary workers. A survey of aerospace manufacturing employers (also conducted by the COE) projects the growth rate in advanced manufacturing jobs in the next five years to be 47 percent.

CHALLENGES

Manufacturing programs, including aerospace manufacturing, suffer from a number of problems in Southern California, including out-of-date and negative perceptions of the industry. Aerospace manufacturing suffers from this image problem as does the broader category of manufacturing. Aerospace manufacturing education programs are expensive to run, and it is difficult to find individuals qualified and interested in teaching in such programs. Furthermore, truly effective aerospace manufacturing programs require a strong dose of industry involvement in areas such as curriculum design, supplying of usable equipment, and providing instructors in relevant areas.

APPROACH

Although the aerospace industry has been an anchor for the economy in the region for decades, there remain large misperceptions about aerospace careers and lack of coordination across multiple community colleges, school districts, and credit and non-credit programs. This project has tackled the awareness issue head-on and has worked on stitching together accelerated pathways across the vast educators and programs across the region.

AWARENESS OF AEROSPACE CAREERS

El Camino College has hosted and participated in several events to promote opportunities to the adult student population. To help local adult students learn more about various ways to partner with El Camino College's Advanced Manufacturing programs, the division hosted an Adult Learning Institute forum. El Camino College also offered tours to students from local adult schools.

Outreach efforts have also focused on the recruitment of women into aerospace occupations. El Camino College helped sponsor a high school and college counselors' summit, with over 250 in attendance. El Camino also partnered with Women in Technology and the Society of Woman Engineers to co-sponsor a high school and middle school robotics competition. The College supported the development of a regional conference, "Women in the Trades, Logistics, Manufacturing and Engineering Expo." The focus of the conference was recruiting women to address the aging workforce and help meet the demands of industry. El Camino College participated in the "Girls in Technology" Conference, sponsored by SEALCO (a local workforce board), interacting with young ladies from local high schools, sharing information on opportunities available to females in today's job market in aerospace and other manufacturing occupations.

El Camino College works internally with its college counselors to discuss how students with disabilities can enroll in Advanced Manufacturing and Engineering Technology programs, and what services are available to support their success in the programs.

The Project Lead The Way Engineering program has been adopted by the El Camino College's Engineering Technology department. Courses such as Principles of Engineering, Introduction to Engineering Design and Computer Integrated Manufacturing, provide relevant hands-on activities to stimulate interest, and provide meaningful relevance and improve success in higher level Math and Science courses. Project Lead the Way graduates learn about technology certificates available at El Camino College, and tour the Advanced Manufacturing and Engineering Technology facility and labs. Graduates are being assisted in their transitions from high school to college through a new program with El Camino College Pathways Department. The Pathways Department is also assisting in recruiting students for the ECC Machine Tool Technology classes, as well as computer aided drafting/design classes.

El Camino College secured over \$40,000 in funding for the creation of a maker space on campus. This maker space would allow more interactive activities for high school students who tour the engineering technology labs at El Camino College and also allow a space for current El Camino College Engineering Technology students to do more hands on projects. It will also be opened up to other disciplines on campus to encourage interdisciplinary collaboration for other CTE programs.

In addition, the college has connected significantly with the START program. The START (STEM Training and Robotics Technology) Program is a hands-on, active and rewarding project based program designed to inspire, highlight, and create awareness of Science, Technology, Engineering, and Mathematics (STEM) career pathways, opportunities, and education, while developing critical, creative and innovative reasoning skills through hands-on projects. Students learn to solve problems and develop solutions used in real-world applications found in day-to-day life and the workplace.

PATHWAYS

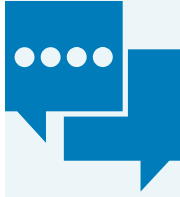
El Camino College helped to create a certificate taskforce met to discuss ways to help advanced manufacturing and engineering technology students earn their certificates at higher and faster rates as part of a larger Guided Pathways project undertaken by the Chancellor's Office in Sacramento.

The pre-apprenticeship grant has started to take on more partners that now include Northrop Grumman, Impresa Aerospace, L3 Communications, LSI Aerospace, Lockheed Martin and others.

PARTNERSHIP WITH NORTHROP GRUMMAN CORPORATION

The Northrop Grumman Corporation's Electronics Assembly and Test Division faced the challenge of meeting workforce needs following a massive spike in work in 2013. In order to cover the additional work, Northrop Grumman increased staff size by 40%. Unfortunately, because of the unforeseen circumstances of the rapid hiring/staffing-up, the department saw a decrease in workmanship and experienced a significant increase in costs. Additionally, personnel conflicts between the new hires and veteran workers began to effect production and moral. Management realized they had made incorrect assumptions regarding past experience of workers, had not devoted enough time to properly training new hires, had underestimated the amount of time needed to develop a competent assembler, and that the company did not have a solid talent pipeline in place.

The Northrop Grumman team contacted El Camino College about partnering for a solution to build their talent pipeline and pool of potential contractors. The partnership allows ECC students interested in obtaining entry-level positions in manufacturing the opportunities to acquire the necessary skill-set to apply for employment at Northrop Grumman. The students receive solder training from senior aerospace engineers and senior assemblers. They learn in a lab working alongside aerospace professionals. Students can also earn college credits for their classroom training. They get access to special plant tours and guest speakers, and interviewing preparation and resume building classes. This partnership allows Northrop Grumman access to a more diverse candidate pool, with several layers of screening and 8-weeks of evaluation before selecting potential hires. The partnership has allowed Northrop Grumman to maintain a competitive workforce, and afforded ECC students a great opportunity to gain work experience in the highly-competitive aerospace industry. A total of nine contractors have been hired from three classes, and five are still active employees.



After completing the program with Northrop Grumman, student Joanna Rivera, gaining college credit, job training, work experience – and a job offer. The timing was perfect, because after several years working at a call center, she was ready to try something new.

“I started that job right out of high school when I wasn’t sure what I wanted to do with my life,” said Rivera. “But I wanted a change. I wanted something more exciting, something with more opportunity, something to make more money – I just wanted to change everything, especially moving from a job to a career.” The change came when she enrolled in El Camino College. Starting with general education courses, Rivera soon found out that she liked computers, technology and electronics. Classwork soon led to the Northrop Grumman program. “I had the best experience at El Camino College and at Northrop Grumman,” said Rivera, who has almost completed her associate degree. “I’m looking forward to more classes and a great career.”

“Through the El Camino College/Northrop Grumman collaboration, students are offered for-credit training in the electronics assembly and test lab at the company’s Space Park facility in Redondo Beach. The partnership with Northrop Grumman is an important part of a student’s education, offering real world experience that can’t be duplicated in a classroom setting, said El Camino College Director for Career Pathways Naomi Castro. “We are really excited about this hands-on program that supports both the needs of a local industry and the needs of our students,” said Castro. “The kind of electrical assembly work they do in this program – no one teaches that in school. Even if students are not hired with Northrop Grumman, this is such great work experience. “This is the perfect example of a program that is helping students gain both college credit and build their resume with a really impressive experience. Northrop Grumman has been a flexible partner, while still being very clear about what they need from us and our students.”

PROJECT OUTCOMES THROUGH MAY 2017

Training Outcomes	Students Entered Training:	Students Continued Training:	Students Earned Certificate:
Aerospace Assembly	803	610	212
Industrial Maintenance	146	111	22
CNC Operations	See Machine Tool		
Machine Tool Operations	370	200	56
Unique Regional Pathway	908	606	136

CONCLUSION

The aerospace manufacturing sector, which is heavily influenced by changes in technology, infrastructure, and public policy, can tell us a lot about how to address the skills gap.



ECONOMIC DEVELOPMENT

Site selector and growing businesses take the strength of the workforce (and the K-12 pipeline) into account when deciding to invest in a new plant. Appropriate training and education needs to be in place before businesses will decide to build in a region. Colleges, industry associations, and the public workforce system must pay attention to trends and labor market intelligence while simultaneously maintaining strong foundational programs such as MSSC CPT, which will provide a base for a number of manufacturing occupations. This project revealed that even in aerospace, the key occupations are related to machining and industrial maintenance; education providers can use these established programs as a jumping off point for new curriculum development.



INNOVATION

From additive manufacturing to composites to biofuels, aerospace manufacturing requires a deep understanding of emerging technologies and a willingness to experiment. It can be cost prohibitive for an individual college or technical center to purchase equipment or materials to keep up with the market, but by working collaboratively with other training providers, public workforce system, and industry partners, education and training providers can share costs and resources in order to regionally train to these innovations.



STACKABLE CERTIFICATION

To meet the needs of industry (which often means filling jobs at a pace that traditional education cannot keep up with) and job seekers, colleges must build in short term programs tied to industry credentials and ensure for-credit programs are willing to accept PLA and credentials for credit. This will allow for rapid upskilling and life-long learning, allowing individuals to take coursework/certificates that update their existing skills to better reflect changes in the industry and return to the workforce quickly.



WORK-BASED LEARNING

Starting early with company tours, job shadowing, and demonstrations (such as those at Manufacturing Day and other similar events) will give young people the exposure to careers that they need to begin planning early for appropriate education and training choices. Adding internships, co-ops, and apprenticeships to high school and post-secondary programs will allow graduates to begin building a professional network and gaining valuable experience before joining the full-time workforce. This is a win-win for companies that get a chance to vet job candidates before hiring them.



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