School: MSD of Decatur Township
School Type: Urban / Suburban
Total HS Enrollment: 1830
Anticipated Enrollment in LCP: 25
Point of Contact: Dr. Chris Duzenbery
Point of Contact Position: Director of College and Career Readiness
E-mail: cduzenbery@decaturproud.org
Title: Aviation Sheet Metal

CRITERIA 1: Who is the collaborator for this local pathway? (Application **must** include at least one external partner).

a. Who is the collaborator for this local pathway?

- Vincennes University Aviation Training Center (Michael Gerich, Director)
- AAR Corp

b. Are there any additional collaborators?

- Area 31 Career Center

c. Describe how the local pathway was developed with the collaborator?

- The MSD of Decatur Township was invited to join the core team for the EWIN (Education Workforce Innovation Network) grant received by Vincennes University and Republic Airline. Through the core team's work with mapping curricular opportunities and work-based learning experiences, there were many conversations about the need for employees (pilots and mechanics) in the aviation industry. MSD of Decatur began to have conversations with Ryan Goertzen, Vice President of Workforce Development at AAR, about their need for aircraft maintenance personnel. Ideas were exchanged on how a pipeline could be built directly into AAR as an employer partner.

  The premier maintenance certification in the aviation industry is the Airframe and Power plant (A&P) certification. Vincennes University Aviation Technology Center (ATC) provides the coursework and training to students to achieve this certification. Vincennes ATC, in collaboration with Area 31 Career Center, currently offers a two-year high school program that allows a student over the course of his/her junior and senior years of high school, to obtain the Airframe certification. MSD of Decatur students (as a sending school to Area 31) can apply to this program, however, not all who apply are accepted, which may be a result of the students not meeting prerequisites and/or a lack of space in the program.

  A meeting was scheduled with Ryan Goertzen (AAR), Michael Gehrich (Vincennes ATC), Patrick Biggerstaff (Area 31), Chris Duzenbery and Brian Bulmer (MSD of Decatur) to discuss building a program to provide Decatur students another avenue to engage in aviation maintenance and be able to earn a certification. MSD of Decatur desired a certification that could be earned in a relatively short period of time. AAR was interested in getting trained workers employed. We discussed the idea of focusing specifically on the sheet metal aspect of the Airframe certification. By focusing on only a portion of the overall Airframe certification with coursework completed at Vincennes ATC, this critical component of aircraft maintenance could be completed in a shorter period of time. Vincennes indicated the prerequisites for the coursework could be adjusted to allow for a larger number of students to qualify to take the coursework. We mapped out the number of hours required for the coursework and the potential schedule for the students to accomplish the classes through Vincennes University for dual credit opportunities. AAR has a Sheet Metal certification based on industry standards.

d. Describe the collaborator's ongoing role in and support of the local pathway.

- The collaborators for the Aviation Sheet Metal Pathway were chosen to support three areas of the pathway development including CTE programming, higher education, and employment/workforce.
  Area 31 Career Center will continue to support MSD Decatur Township schools with CTE programming including advising on pathway development and filing the INTERS report. Vincennes University Aviation Technology

Center will serve as the provider of course content and instruction. AAR Corp. will collaborate with Vincennes ATC to design the coursework for the Sheet Metal certification. As the employer partner, AAR will provide employment opportunities for students earning the Sheet Metal certification.
In addition to these specific roles, each collaborating partner will assist the MSD of Decatur Township in the following ways:

1) Vision, strategic planning, and monitoring
2) Training for students enrolled in the pathway
3) Outside the classroom experiences that add authenticity and rigor to the pathway for students' future roles in the workforce. The experiences may include, but are not limited to; focused field trips, job shadows, internships, and other authentic industry/postsecondary experiences.

e. If applicable, describe how the proposed LCP is aligned to regional, state, and local labor market and economic needs, as well as high wage and/or high demand data. Regional economic needs and high wage and/or high demand data may include: local current employment (number of jobs opened and/or filled), local occupational outlook (projected openings), or local asset mapping. Applications must include any cited or related data or resources in application submission.

- The labor market and demand data information for this pathway is several pages long and contains numerous charts and graphics. This information will be submitted as separate attachment.

CRITERIA 2: LCPs must provide students with recognized postsecondary knowledge and skills (e.g., credits, credentials) that prepare students for meaningful postsecondary education/training and/or employment opportunities.

a. Provide an overview that describes the LCP and student expectations. Identify end-of-program assessments and opportunities for students to participate in early college and/or early career experiences. List each course title of the LCP with an overview of what students should know and be able to demonstrate upon completion.

- Students in this pathway will take coursework during their 9th and 10th grade years to introduce them to the manufacturing, transportation, and aviation industries including, Introduction to Manufacturing, Introduction to Transportation, and Aerospace Engineering. Students will take Physics as a required Core 40 science class. In addition to providing background in the aviation industry, the Aerospace Engineering class (Project Lead the Way or non-PLTW) will count as a 3rd Core 40 science class. (pathway course chart attached)

  Vincennes ATC has created two college courses specifically focusing on sheet metal. The course numbers/names/ and credits are: AMNT 108 - Aircraft Sheet Metal I (4 credits) and AMNT 109 - Aircraft Sheet Metal II (4 credits). Students can earn up to 8 college credits through Vincennes University at Vincennes Aviation Training Center.
  (VU Syllabi/Course descriptions attached)

  Currently there are two IDOE courses for Aviation Maintenance, (5520) Aviation Maintenance I and (5522) Aviation Maintenance II. These courses are designed to cover a wider scope of aviation maintenance than just Sheet Metal.
  There is a need to create two new high school courses designed specifically to align with the areas of aircraft structures and sheet metal. Course descriptions have been created for the proposed courses are: 55XX Aviation Sheet Metal I and 55XX Aviation Sheet Metal II. These course descriptions include what students will be expected to know and be able to demonstrate.
  (high school course proposals/descriptions attached)

  AAR Sheet Metal Certification has been created by AAR based on CertTEC Sheet Metal standards. Students who successfully complete this course with a 70% or higher will receive a course completion certificate from AAR.
  (AAR Sheet Metal Structures Certificate attached)
  AAR created the EAGLE Career Pathways program that allows students to learn and earn and progress through a career pathway in the aviation industry. Vincennes ATC provides the coursework and instruction for the A&P. Students in the Aviation Sheet Metal Pathway will be able to enroll in the EAGLE Career Pathways program and

through the Next Level Jobs grant be able to take the coursework for Airframe for free. While taking coursework the students will be employed at AAR and can earn while they learn. AAR provides tuition assistance allowing students to work toward paying for the Power plant certification. (Career Pathway Progression attached)

b. Explain the academic, technical, and employability skills and knowledge students will acquire in the LCP. Please be as specific as possible.

1. Academic

- Reading, writing, listening and speaking skills. Applying math to solve problems. Critical thinking

2: Technical

- Forming, bending, cutting, and riveting aircraft sheet metal structures. Reading, interpreting, and understanding aircraft diagrams, blueprints, charts, and schematics. FAA regulations and requirements for sheet metal repairs. Using computers. Ability to read measurement devices. Install/remove conventional rivets. Practice appropriate safety measures. Use of basic hand tools. Use of basic shop tools. Critical thinking.

3. Employability

- Problem solving and analytical skills. Verbal and written communication skills. Interpersonal skills. Good attendance. Critical thinking.

c. Explain extended early career and/or college opportunities available to the student in the LCP:

1. Cooperative Education

- N/A

2. Structured Internship

- Internships

3. Youth apprenticeship:

- N/A

4. On-the-job Training:

- N/A

5. College transition services:

- The Vincennes University courses are not part of the FAA approved Airframe and Power plant (A & P) program so they will not directly be recognized toward that Associate's degree. However, students will acquire basic knowledge of aviation maintenance as it pertains to sheet metal structures. Experiencing success in college courses may create the confidence necessary students to continue on to the A & P program and ultimately earn the Airframe & Power plant certification.

6. Other:

- Site tour of VU/AAR (Tug & Tour) – spring of junior year. Job Shadowing – fall semester of senior year.

CRITERIA 3: The LCP must be evaluated and continuously improved based upon the evaluation at the state and local level. Applicant will serve as a model and point of contact for other districts interested in adopting or creating a similar pathway.

a. What are the intended outcomes for students who complete this pathway?

Certification/credential/license:

- AAR Sheet Metal Certification

2. Articulated or transcripted college credits:

- AMNT 108 - Sheet Metal I (4 credits) AMNT 109 - Sheet Metal II (4 credits)

3. Advanced employment standing (or other employment benefits):

- Guaranteed job interview for open position at AAR

4. Other:

b. How will the school and district measure student outcomes? (This may include but is not limited to: data from the Commission for Higher Education, Management Performance Hub, the Department of Workforce Development, employer surveys, or student surveys.)

- The outcomes listed will be measured by the district's student management system when possible. When that is not possible, the high school's small learning community counselor for each student will track the metrics. The students will have career meetings with their counselor no less that two times a year. Information on each student is tracked in Naviance and in the student's ePortfolio.

Metrics that will be tracked include:

- # of students applying to program and getting accepted
- # of students passing VU courses
- # of students earning the AAR Sheet Metal Certification
- # of students getting hired at AAR and other aviation organizations
- # of students retained by AAR after 90 days of employment

c. What process will the school and district have in place to evaluate and continuously improve the pathway based upon that evaluation?

- Annual meetings will be occur between MSD of Decatur Township administration/teachers, Vincennes University, AAR personnel, and Area 31 Career Center to discuss curriculum alignment, as well as the requirement for any adjustment based upon new industry needs. During these meetings we will discuss the preparedness of the current graduates and evaluate student assessment to ensure that both the skills and proficiency levels are in alignment with industry need. Additional information meetings may be held to schedule site visitations, tours, and other work-based learning experiences. Communication between VU and Decatur Township schools will also occur at grade posting time.

Labor Market and Demand Data

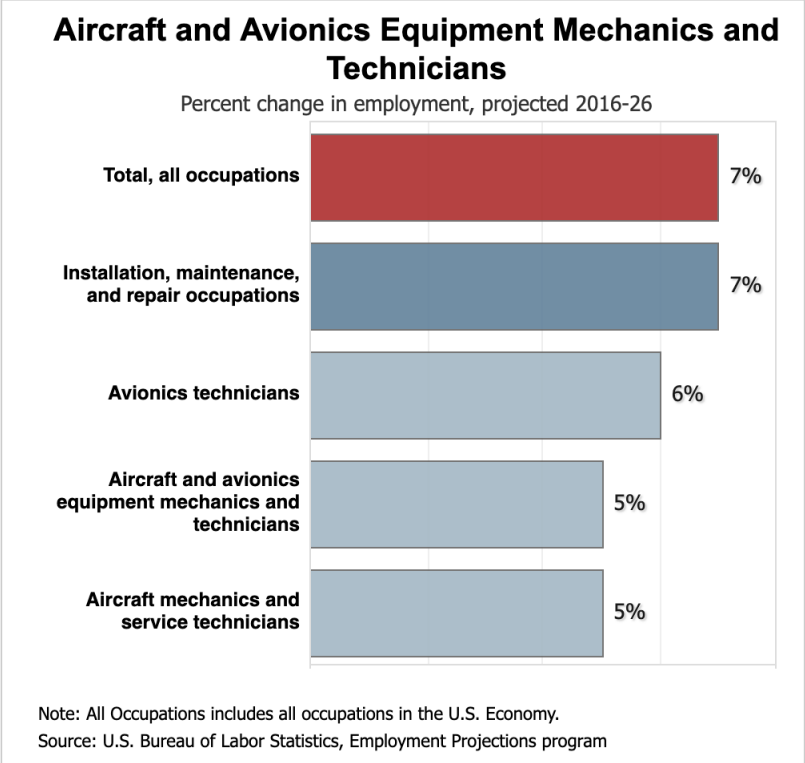
Job Outlook and Demand

According to the Bureau of Labor Statistics – Occupational Outlook Handbook, Air travel is expected to increase in the next ten years. With increased demand for travel comes an increased demand for the mechanics and technicians who maintain the aircraft. Some airlines may outsource their maintenance work to maintenance, repair, and overhaul organizations (MROs) both domestically and abroad.

The overall employment of aircraft equipment mechanics and technicians is projected to grow five (5) percent from 2016 to 2026. Job outlook is forecasted to be good because there will be a need to replace those employees leaving the occupation, especially those who leave due to retirement.
Source: https://www.bls.gov/ooh/installation-maintenance-and-repair/aircraft-and-avionics-equipment-mechanics-and-technicians.htm

Figure 1 below illustrates the percent change in employment projected for 2016-2026 for Aircraft and Avionics Equipment Mechanics and Technicians.

Figure 1



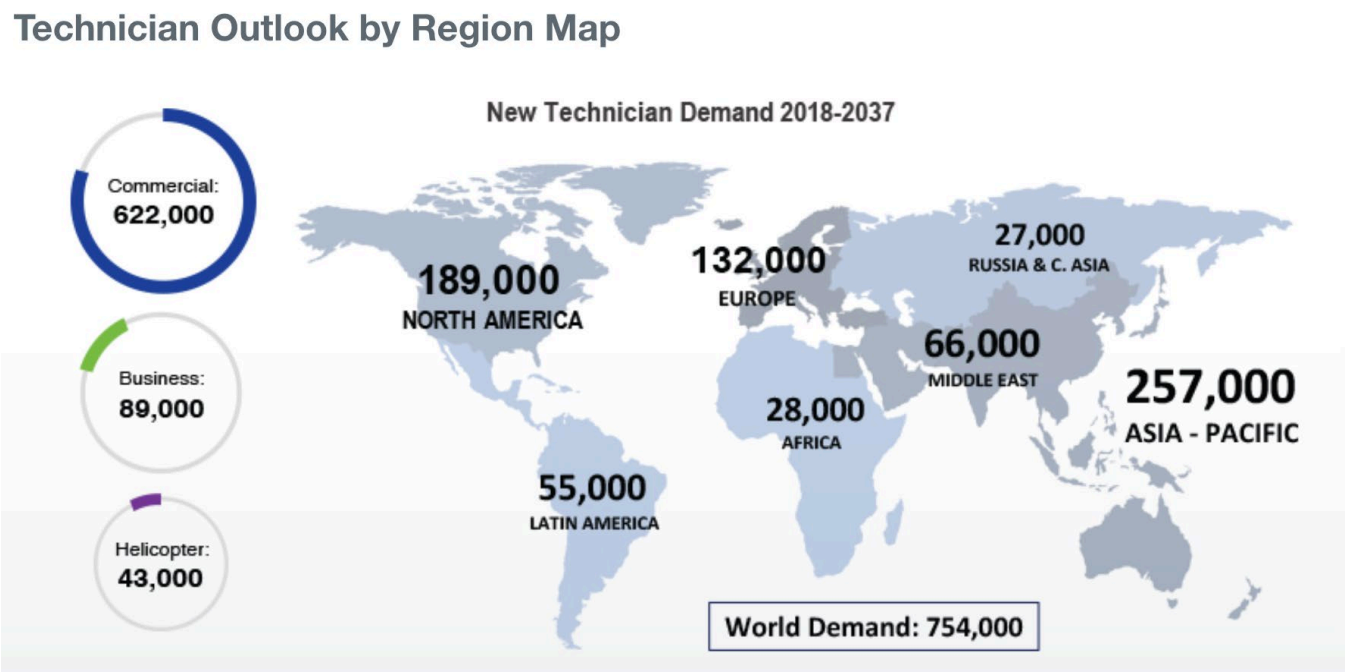
Aviation growth is outpacing labor capacity. The shortage is due in part to an aging workforce. Between now and 2027, a record number of maintenance technicians will be eligible to retire as more baby boomers reach their sixties. In the United States, the median age of aviation mechanics is 51 years old. While there are plenty of people in the millennial generation who could take the place of the retiring workers, at this point, they are not showing signs of being willing to do so. Source: https://www.miat.edu/2018/06/the-growth-of-the-airline-inudstry-an-aviation-mechanics-guide/

The new entrants into the industry are not keeping pace with the retiring work force. Year over year, the newly certificated mechanics only make up two percent of the entire population of mechanics. Using a ten-year average rate of change for new mechanics (1.1%), and assuming an average retirement age of 65, the

rate of departing mechanics is expected to outpace the new entering mechanics at a rate of 4:3 through 2037. Source: ATEC Pipeline Report 2018 https://www.atec-amt.org/pipeline-report.html

Over the next two decades, nearly 120,000 new commercial aviation maintenance technicians will be needed in North America alone. By 2036, an estimated 648,000 will be needed worldwide. The Oliver Wyman 2017 Maintenance, Repair, and Overhaul (MRO) survey suggests that the gap between the demand and supply of aviation mechanics in the United States will develop by 2022 and reach a peak of nine (9) percent by 2027. Source: https://www.miat.edu/2018/06/the-growth-of-the-airline-inudstry-an-aviation-mechanics-guide/

Figure 2 Boeing's Technician Outlook 2018-2037



Source: https://www.boeing.com/commercial/market/pilot-technician-outlook/2018-technician-outlook/#/overview

Figure 2 illustrates the outlook for Boeing's technicians between 2018-2037. According to Boeing, the commercial, helicopter, and business aviation industries combined will require 754,000 new technicians worldwide by 2037, with approximately a quarter of the demand coming from the United States.

Airbus forecasts the doubling of the commercial fleet over the next 20 years with the need for 530,000 new pilots and 550,000 new maintenance technicians. Source: https://www.atec-amt.org/news/airbus-estimates-550000-maintenance-engineer-demand-by-2036

Regional and State Employment Projections

Figure 5 illustrates the Indiana employment projections for Aircraft Mechanics and Service Technicians for Region 5 – Indianapolis. The projected employment increase by 2026 is 14.7%, which outpaces the statewide projection at 12.7% shown in Figure 6.

Indiana Employment Outlook Projections

Occupation: Aircraft Mechanics and Service Technicians

Region 5 (Indianapolis) http://www.hoosierdata.in.gov/FD/landing.aspx

Figure 5

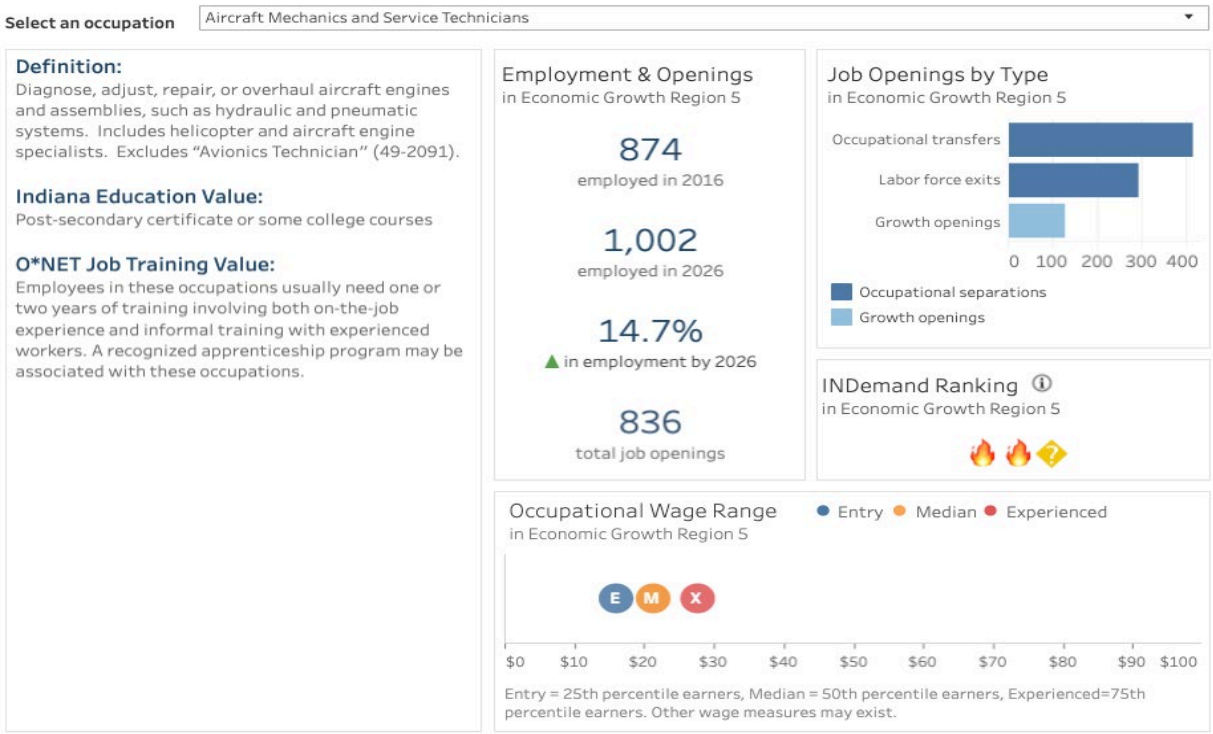
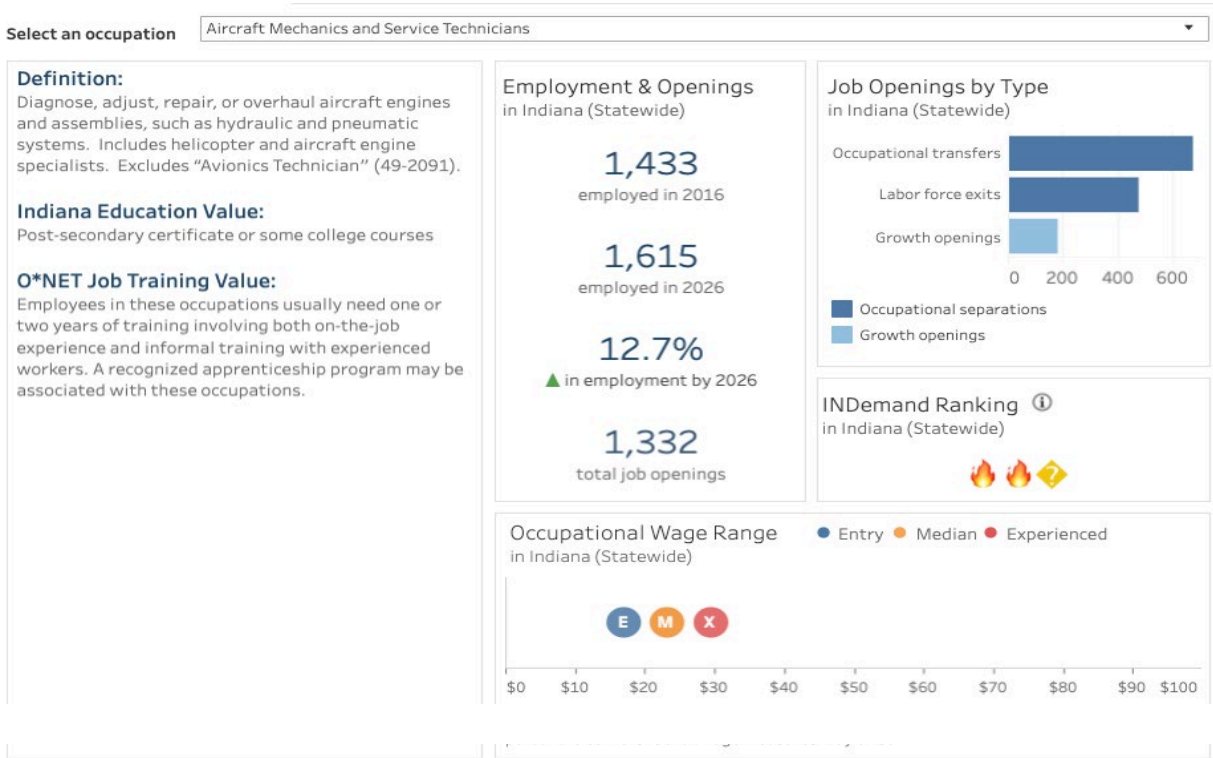


Figure 6 Statewide Employment Outlook Projections



According to INDemand Jobs, the INDemand ranking for Aircraft Mechanics and Service Technicians is 3 out of 5 flames, with an average salary of $47,820. Source: https://www.indianacareerready.com/indemandjobs

Job Postings

On *Indeed.com* there were approximately 35 job postings for Aviation or Aircraft mechanics in Indianapolis. There were several Structures Mechanic positions and those that specified Sheet Metal or had Sheet Metal experience as a required qualification. An example of a Structures Mechanic posting appears below:

Structures Mechanic

Newgen Aviation Corporation

Indianapolis, IN 46241

$31 an hour

We're hiring an experienced Aircraft Structures-Sheet metal Mechanic. Duties of a Structures Mechanic.*

A Structures Mechanic will perform Airframe Structures Alterations on Airbus and Boeing...

Location:

2825 W Perimeter Rd, Indianapolis IN 46241

*Duties of a Structures Mechanic

- Perform sheet metal corrosion control
- Perform repairs and or replacements, including layout, forming, drilling, and trimming of sheet metal parts, such as door sills, stringers, shear ties
- Perform replacements on floor beams, profiles
- Remove and Install rivets
- Installation of hi-loks; oversized fasteners
- Drill round, straight and countersink holes
- Manage and keep all paperwork up-to-date

In the category of Aviation Maintenance – Sheet Metal or Sheet Metal Structures; below are several examples of the job openings in Indianapolis:

- STS Technical Services – Indianapolis has a posting to hire Aircraft Sheet Metal Mechanics.
- HSGI, Inc. – Indianapolis has a posting for an A & P Mechanic Sheet Metal (2 positions with immediate start) with salary ranging from $25,000 - $28,000.
- Matthews Aviation – Aircraft Structures Mechanic (Sheet Metal) – Indianapolis has a posting with salary listed as $25 - $31 an hour.
- Comlux Aviation – Indianapolis has a posting for a Sheet Metal Technician III.
- AAR Corp – Aircraft Services – Indianapolis – posting for Sheet metal Technician.

Openings posted across the United States:

- STROM Aviation has 36 position postings for Sheet metal Technician Jobs across the United States.
- ZipRecruiter's site yielded 3,597 Aviation Sheet Metal Technician Jobs across available across the country. A search for Aircraft Structures Mechanic resulted in 5,948 jobs.

Creating a Pipeline

According to the 2017 Oliver Wyman MRO survey, 64 percent of the surveyed executives expect their companies to hire mechanics over the next 3 years to expand the workforce; another 23 percent say they will hire simply to maintain their numbers. Seventy-two percent of those surveyed expect the search for qualified candidates to get much harder. To help mechanics develop necessary skills, 84 percent of survey respondents said their companies were offering classes and workshops, while 61 percent said they had established partnerships with technical schools or colleges. Since aviation competes with other industries to attract the sheer quantity of interested new hires it needs now, companies will have to look well beyond the usual tactics of opening up additional training programs.

The aviation industry has resorted to coming up with creative ways to relieve the pressure of the demand for labor. Last year, JetBlue began a maintenance apprentice program aimed at training new MROs in the necessary maintenance, overhaul and replacement of aircraft parts. The budget airline company has also begun working with a local New York high school to develop a curriculum surrounding a career in aircraft maintenance. While these programs are in the pilot stages, their success could mean replicable options for other airlines to consider. The future of air transportation could depend on programs like this.
Source: https://www.proponent.com/3-big-impacts-aircraft-maintenance-2017/

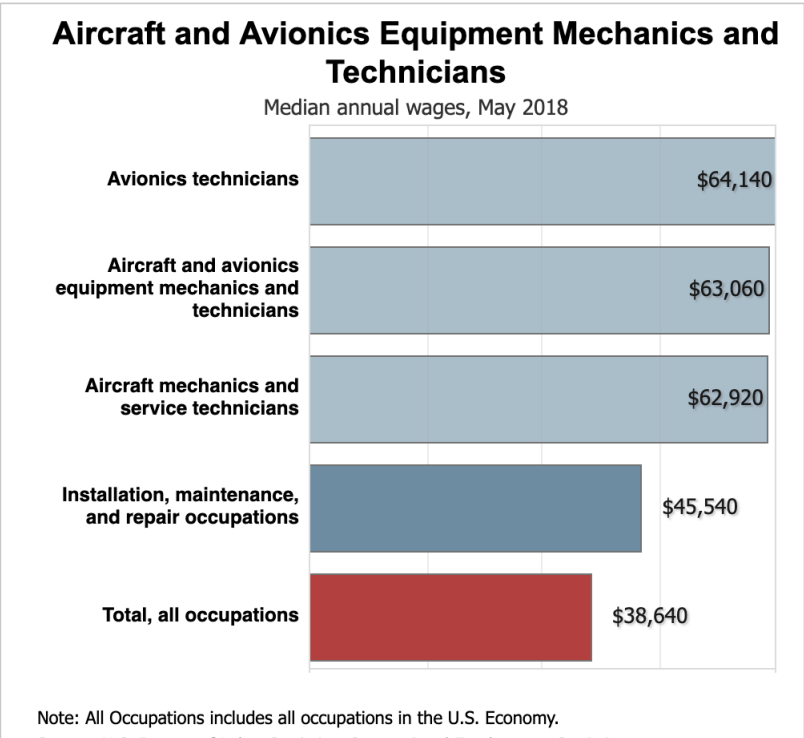
According to an article in Lift Magazine, Chuck Horning, chair of the aviation maintenance science (AMS) department at Embry-Riddle, says "work-arounds" are relieving some of the pressure. "Repair stations will hire individuals who don't have airframe and powerplant certificates, if they have a skill in a certain area — say sheet metal," Horning says. "A certified A&P is often used to provide oversight of the work. That's being done today pretty widely. It makes the situation a little less dire." The pressure on the industry is paying off for technicians, though. Horning says today a topped-out A&P technician working for a major airline can earn $100,000-plus annually. Source: https://lift.erau.edu/aircraft-mechanics-wanted/

Wages

Aircraft and Avionics Equipment Mechanics and Technicians

In 2018, the median annual wage for aircraft mechanics and service technicians was $63,060 per year or $30.32 per hour. Figure 3 below illustrates the median wages of Aircraft and Avionics Equipment Mechanics and Technicians as of May 2018.

Figure 3

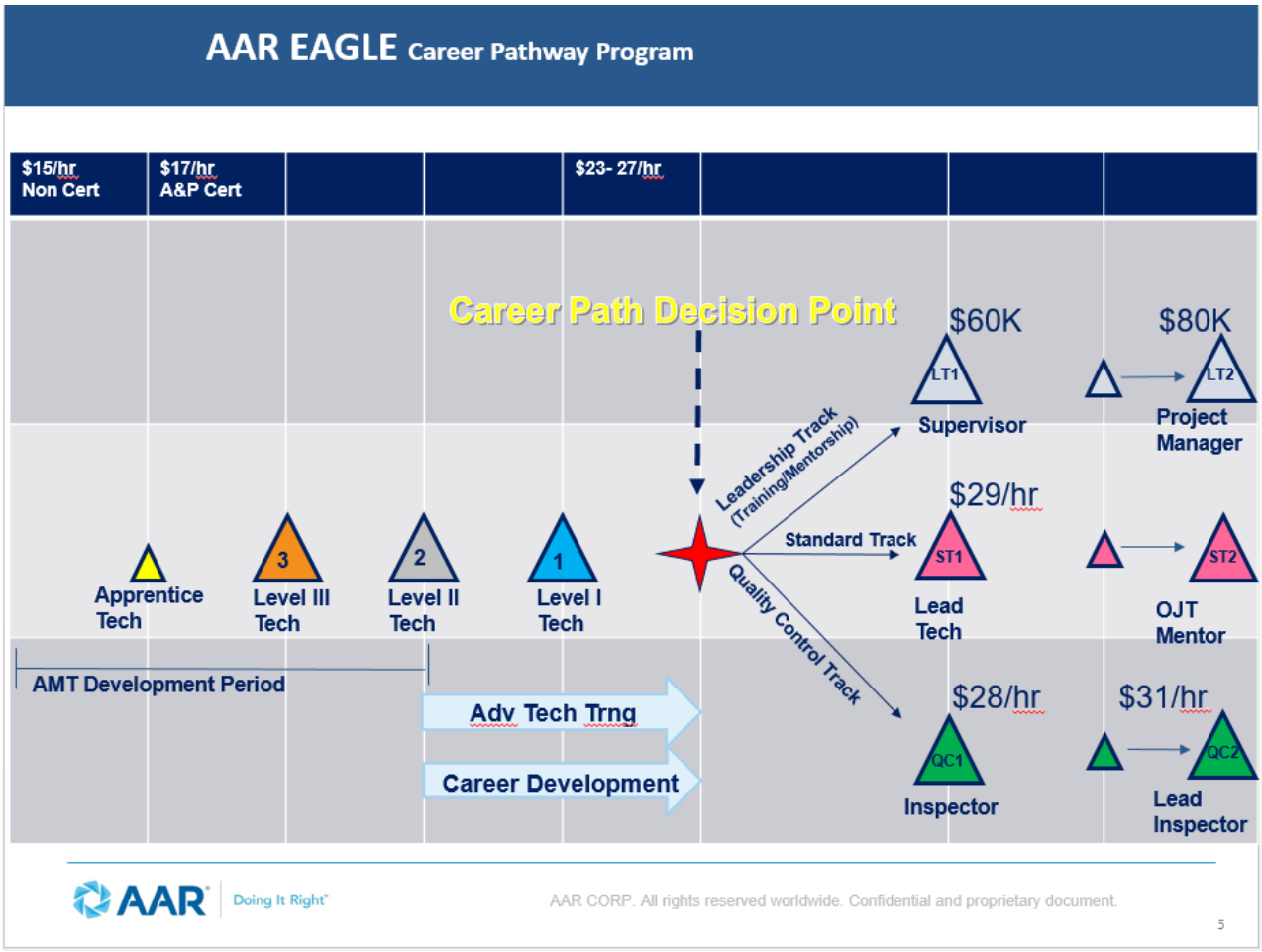


Source: https://www.bls.gov/ooh/installation-maintenance-and-repair/aircraft-and-avionics-equipment-mechanics-and-technicians.htm

AAR EAGLE Career Pathway – Pipeline and Wages

AAR Corp has created a pipeline into aviation maintenance through their partnership with Vincennes University Aviation Technology Center (ATC) called the EAGLE Careers Pathway. As a part of this pathway, students at Vincennes University ATC can work at AAR while they are taking courses to earn their Airframe and Powerplant certification. Figure 4 illustrates the progression of wage increases as an employee gains additional training and experience. Employees can start out at $15/hour as a non-certified Apprentice Tech and increase from there as they increase in their levels of training.

Figure 4



Source: graphic provided by Ryan Goertzen, AAR Corp.

SYLLABUS

AMNT 108 AIRCRAFT SHEET METAL I

VINCENNES UNIVERSITY INSTRUCTOR:.....
AVIATION MAINTENANCE TECHNOLOGY OFFICE:.....
INDIANAPOLIS INTERNATIONAL AIRPORT PHONE:.....

COURSE DESCRIPTION: This course introduces the student to various techniques of fabricating and repairing aircraft sheet metal structures. Structural load analysis and assessment of damage, characteristics of aluminum alloys, standard and special fastener installation, and layout and forming techniques are emphasized.

150 curriculum contact hours 50% lecture and 50% lab.

COURSE FOCUS: This course is designed to develop skills in the inspection and repair of aircraft sheet metal structures. Using manufacturer's structural repair manuals and F.A.A. advisory circulars as references, the student will layout, fabricate, and install sheet metal repairs that conform to F.A.A. return-to-service standards. Using standard references, the student will select various sheet metal fasteners and use the proper installation tools to accomplish repairs. This course also addresses the aerodynamic stresses applied to sheet metal structures and the assessment of damage in determining airframe repairability.

COURSE GOALS/OBJECTIVES:

1. Introduction
2. Safety
3. Skin Quality
4. Quality Workmanship
5. Introduction to Aviation
6. Theory of Flight
7. Airfoil
8. Aircraft Axes
9. Aircraft Stress
10. Aircraft Major Assemblies
11. Aircraft Zones
12. Aircraft Metals
13. General Information
14. Types and Application
15. Identification
16. Reading the Six Inch Scale
17. Aircraft Structural Fasteners
18. Solid Rivets
19. Blind Rivets
20. Blind Bolts
21. Hi-Lok Fasteners
22. Hi Shear Rivets
23. Aviation Blue Prints:

24. Introduction of drawings

PERFORMANCE OBJECTIVES:

This course covers the following topics:

1. Safety- around aircraft, shop practices with machines and hand tools.
2. Introduction to Aviation
3. Aircraft Metals
4. Shop Hand Tools and Machines
5. Aircraft Structural Fasteners
6. Aviation Blueprints

Student Learning Outcomes:

Upon successful completion of the course, students will be able to:

1. Apply concept of Aviation
2. Practice appropriate safety measures.
3. Inspect and repair sheet metal structures.
4. Install/Remove conventional rivets.
5. Form, layout, and bend sheet metal.
6. Read and interpret aircraft blueprint diagrams.

COURSE REFERENCES/TEST:

FAA-H-8083-30 Aviation Maintenance Technician Handbook – General

FAA-H-8083-31 Aviation Maintenance Technician Handbook – Airframe

AC43.13-1B, 2B

Standard Aviation Maintenance Handbook

Federal Aviation Regulations for Aviation Maintenance Technicians

COURSE EVALUATION:

1. The student will be evaluated in two separate areas, theory and laboratory

   A) Final Theory Grade will be the calculated from the scores of:

      1) Possible quizzes

      2) 3 Unit exams

      3) 1 Final comprehensive exam

   B) Final Laboratory Grade will be calculated from the required projects. All laboratory project sheets have clearly defined objectives and evaluation criteria.

   C) Final Course Grade will be calculated from the Final Theory and the Final Laboratory grade.

2. In order to qualify for a passing grade in this class the student must first meet the three following requirements.

   A) The lecture average for the course must be at least 70%.
   B) The grade for each lab project must be at least 70%.
   C) Attendance is mandatory. Any time missed, excused or not, must be made up in accordance with the current attendance policy.

3. GRADING SCALE

The following grading scale is used to determine the student's final grade after the Federal Aviation Administration's requirements have been met.

FINAL CLASS GRADE	LETTER GRADE	POINT VALUE
94 - 100	A	4.0
90 - 93	A-	3.7
87 - 89	B+	3.3
83 - 86	B	3.0
79 - 82	B-	2.7
76 - 78	C+	2.3
73 - 75	C	2.0
70 - 72	D	1.0
0 - 69	F	0.0

If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please make an appointment with the instructor as soon as possible.

SYLLABUS

AMNT 109 AIRCRAFT SHEET METAL II

VINCENNES UNIVERSITY INSTRUCTOR:.....
AVIATION MAINTENANCE TECHNOLOGY OFFICE:.....
INDIANAPOLIS INTERNATIONAL AIRPORT PHONE:.....

COURSE DESCRIPTION: This course expands on the knowledge students learn in AMNT 108. The student will gain further knowledge and skills in various techniques of fabricating and repairing aircraft sheet metal structures. Structural load analysis and assessment of damage, characteristics of aluminum alloys, standard and special fastener installation, and layout and forming techniques are emphasized.

150 curriculum contact hours 50% lecture and 50% lab.

COURSE FOCUS: This course is designed to develop skills in the inspection and repair of aircraft sheet metal structures. Using manufacturer's structural repair manuals and F.A.A. advisory circulars as references, the student will layout, fabricate, and install sheet metal repairs that conform to F.A.A. return-to-service standards. Using standard references, the student will select various sheet metal fasteners and use the proper installation tools to accomplish repairs. This course also addresses the aerodynamic stresses applied to sheet metal structures and the assessment of damage in determining airframe repairability.

COURSE GOALS/OBJECTIVES:

1. Introduction
2. Safety
3. Materials and Fabricating
4. Special Alloys
5. Drilling and Countersinking
6. Forming
7. Machining
8. Making Layouts
9. Riveting
10. Aviation Blueprints
11. Corrosion Removal, General Repairs and Surface Finishing Requirements

PERFORMANCE OBJECTIVES:

This course covers the following topics:

1. Safety- around aircraft, shop practices with machines and hand tools.
2. Introduction to Aviation
3. Aircraft Metals
4. Shop Hand Tools and Machines
5. Aircraft Structural Fasteners
6. Aviation Blueprints

Student Learning Outcomes:

Upon successful completion of the course, students will be able to:

1. Apply concept of Aviation
2. Practice appropriate safety measures.
3. Inspect and repair sheet metal structures.
4. Install/Remove conventional rivets.
5. Form, layout, and bend sheet metal.
6. Read and interpret aircraft blueprint diagrams.

COURSE REFERENCES/TEST:

FAA-H-8083-30 Aviation Maintenance Technician Handbook – General

FAA-H-8083-31 Aviation Maintenance Technician Handbook – Airframe

AC43.13-1B, 2B

Standard Aviation Maintenance Handbook

Federal Aviation Regulations for Aviation Maintenance Technicians

COURSE EVALUATION:

1. The student will be evaluated in two separate areas, theory and laboratory

   A) Final Theory Grade will be the calculated from the scores of:

      1) Possible quizzes

      2) 3 Unit exams

      3) 1 Final comprehensive exam

   B) Final Laboratory Grade will be calculated from the required projects. All laboratory project sheets have clearly defined objectives and evaluation criteria.

   C) Final Course Grade will be calculated from the Final Theory and the Final Laboratory grade.

2. In order to qualify for a passing grade in this class the student must first meet the three following requirements.

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   B) The grade for each lab project must be at least 70%.
   C) Attendance is mandatory. Any time missed, excused or not, must be made up in accordance with the current attendance policy.

3. GRADING SCALE

   The following grading scale is used to determine the student's final grade after the Federal Aviation Administration's requirements have been met.

FINAL CLASS GRADE	LETTER GRADE	POINT VALUE
94 - 100	A	4.0
90 - 93	A-	3.7
87 - 89	B+	3.3
83 - 86	B	3.0
79 - 82	B-	2.7
76 - 78	C+	2.3
73 - 75	C	2.0
70 - 72	D	1.0
0 - 69	F	0.0

If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible.

Career Pathway Progression
Sheet Metal Technician to A & P Mechanic

AAR Corp. has developed an aviation career progression program called the **EAGLE Career Pathway Program** to bridge the middle skills gap to careers in Aviation. The EAGLE Career Pathway program is dedicated to growing the talent necessary to meet the maintenance demands of the future with a focus on five Core Values:

- **E**thics
- **A**irworthiness
- **G**reatness
- **L**eadership
- **E**ngagement

The EAGLE Career Pathway Program has been developed to address the severe shortage of technicians plaguing AAR and the broader aviation industry. EAGLE is the first-ever career pathway program focused on aviation maintenance technician careers and beyond.
EAGLE uses stackable credentials to:

1. Help students advance more quickly to jobs on multiple tracks.
2. Create a pathway to become an FAA-certificated airframe and powerplant (A&P) mechanic.
3. Open up new markets of talent that can be utilized throughout the AAR MRO network.
4. Create direct paths to jobs available now.

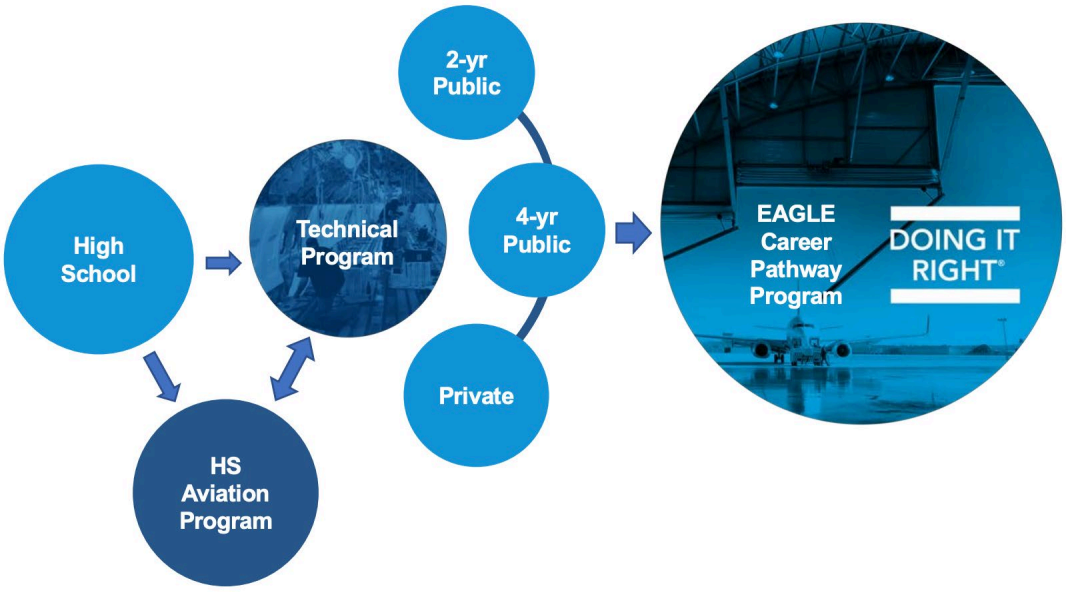
According to Ryan Goertzen, Vice President, Aviation Workforce Development at AAR, "the maintenance career path has been shrouded in mystery and occurring beyond the security fence, limiting access and understanding by the general public. EAGLE attempts to bring clarity by defining the career path beyond the technician to positions in management, maintenance operations and quality control. Within these defined paths are even more positions and departments that provide for opportunities for personnel to grow their aviation maintenance career."

AAR has partnered with colleges and universities in a number of cities where their MRO facilities are located including Rockford and Chicago, Illinois; Duluth, Minnesota; Oklahoma City, Oklahoma; Kalamazoo, Michigan; and Miami, Florida to establish EAGLE Career Pathway programs. AAR's newest partnership, launching an AAR EAGLE Career Pathway program is with Vincennes University Aviation Technology Center (ATC) in Indianapolis.

Vincennes University ATC is a 92,000-square-foot facility that provides state-of-the-art aviation training programs for Vincennes and Purdue Universities in airframe and power plant mechanic and airframe sheet metal technician careers requiring FAA. For nearly a decade, AAR's Indianapolis Maintenance Center (IMC) has been the training ground for Vincennes University students enrolled in its aviation education program. The IMC is a 1.6 million square-foot facility located near Indianapolis International Airport. AAR also has teamed up with Republic Airlines to heighten awareness of aviation maintenance careers locally among students ages K through 16. The initiative is funded through a workforce development grant provided by the Education Workforce Innovation Network (EWIN) and already has led to a unified aviation educational approach within the MSD of Decatur and MSD of Wayne townships near Indianapolis International Airport.

EAGLE Career Pathway marks an expansion of AAR's existing relationships with colleges in Rockford, Duluth, and Indianapolis, enhancing the curriculum and the job experience. These schools also benefit from a special Support Technician job category created by AAR to onboard talent faster. Mechanics in training and technician apprentices gain experience inside the MRO, if not on aircraft themselves, and earn while they learn. Figure 1 illustrates the progression from high school into Aviation training.

Figure 1 EAGLE Career Pathway



Why is AAR focusing on developing *Sheet Metal Technicians* in Indianapolis? Employment of sheet metal workers is projected to grow 9 percent from 2016 to 2026, according to the U.S. Bureau of Labor Statistics. Because aircraft sheet metal is not regulated by the Federal Aviation Administration (FAA), industry and educators can develop creative onboarding strategies tuned to the needs of business to get talent in the career pipeline faster. To fast-track careers, industry is focusing on developing short courses whereby students can earn stackable skills credentials that lead to FAA certification or a two-year associate's degree, and career advancement.

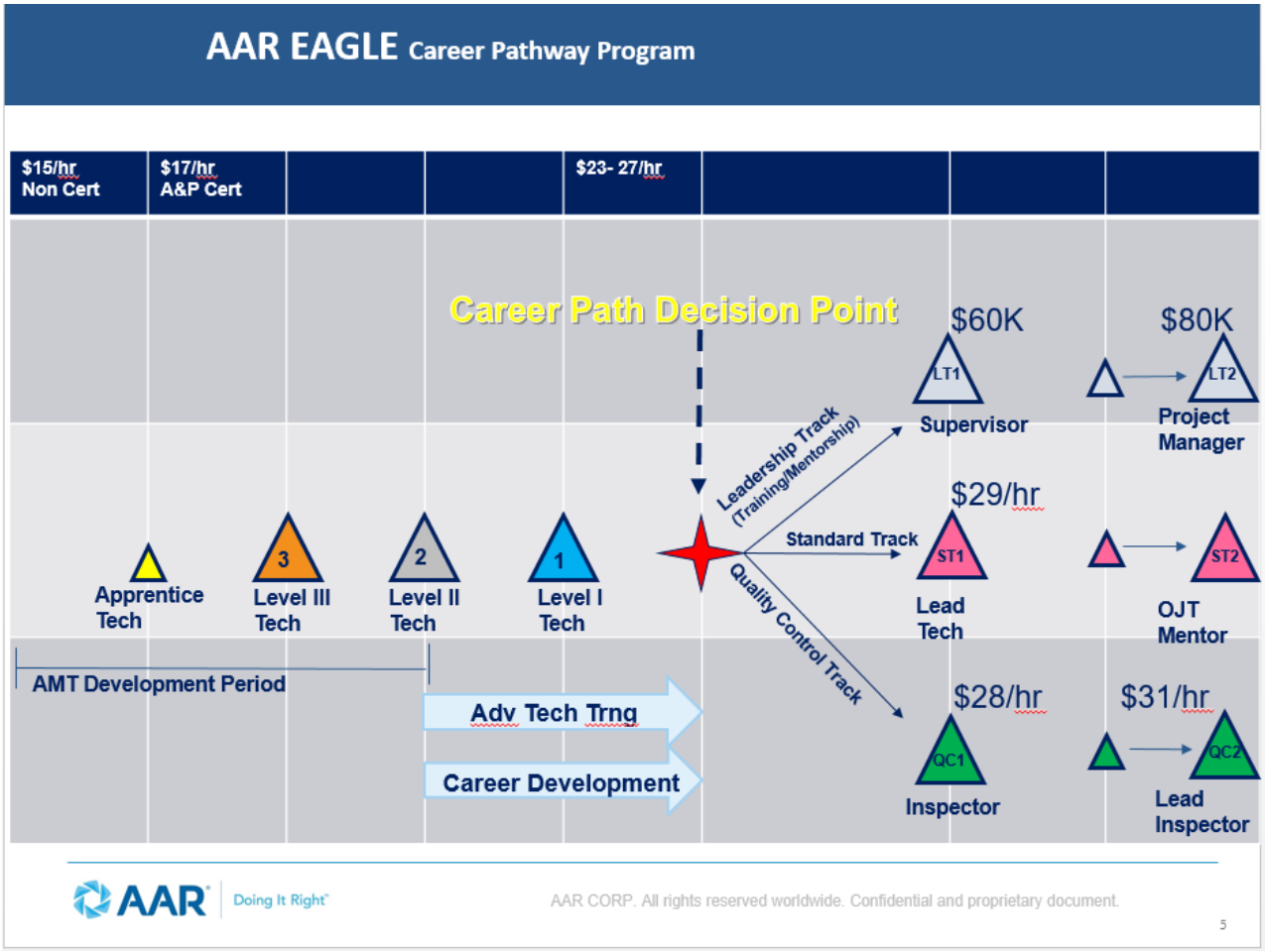
To get talent into the pipeline faster for the Indianapolis MRO, AAR has partnered directly with the MSD of Decatur Township to provide the student pool. Vincennes University ATC will provide the training for the 300-hour Sheet Metal certification. The AAR career pathway progression allows students to learn and earn. While in the Sheet Metal program, students can apply to the EAGLE program and continue to attend Vincennes while working at AAR as uncertificated Apprentice Technician. These employees will have two options to gain Federal Aviation Administration (FAA) Airframe and Powerplant (A&P) certification through this structured career pathway.

1. The students can receive credit for the Sheet Metal curriculum through Vincennes University ATC and complete the rest of their A&P at night. With A&P considered a *Next Level Jobs* program the students can complete this training for the first part of the certification (Airframe) for free through Vincennes University ATC.
2. Upon meeting the FAR part 65 - regulatory requirement of 18 months of work experience, AAR will help these students/employees test for the Airframe portion of the A&P at zero cost to the employee.

3. AAR is providing up to $15,000 in tuition assistance to be paid toward the employee's FAA certification training. Student will earn this tuition assistance and salary increases by growing their skills within the framework of the EAGLE program from a Level III technician to Level I. Employees must hold an FAA certification in order to reach Level I technician status at AAR.

The AAR EAGLE Career Pathway program with career progression is illustrated in Figure 2 below.

Figure 2 **AAR Career Pathway Progression**



Sources:
1) https://www.aarcorp.com/assets/3/7/AAR_EAGLE_1.31.19_vFIN4[1].pdf
2) Powerpoint – AAR EAGLE Career Pathway Program: December 17, 2018 provided by Ryan Goertzen (AAR)

Locally Created Pathway

Aviation Sheet Metal Pathway

<u>High School Course Proposal</u>

The proposed high school courses for this pathway focuses specifically on Sheet Metal Structures, therefore the existing courses in Aviation Maintenance (5520 and 5522) that are comprehensive in nature, are not applicable to this pathway. The proposed Aviation Sheet Metal I and II courses below would be taught over multiple class periods to allow for the 150 hours of classroom and lab instruction necessary for each course.

In order for students to complete this pathway in a short period of time, the courses are to taken and completed in one semester. Both of the courses listed below are to be taken during the same semester over multiple class periods.
A non-standard course waiver will need to be submitted for both of the courses listed below.

AVIATION SHEET METAL I
(55XX)
Aviation Sheet Metal I – This course introduces students to various techniques of fabricating and repairing aircraft sheet metal structures. Structural load analysis and assessment of damage, characteristics of aluminum alloys, standard and special fastener installation, and layout and forming techniques are emphasized. This course is designed to develop skills in the inspection and repair of aircraft sheet metal structures. Using manufacturer's structural repair manuals and F.A.A. advisory circulars as references, the student will layout, fabricate, and install sheet metal repairs that conform to F.A.A. return-to-service standards. Using standard references, students will select various sheet metal fasteners and use the proper installation tools to accomplish repairs. This course also addresses the aerodynamic stresses applied to sheet metal structures and the assessment of damage in determining airframe reparability.

- Recommended Grade Level: 12
- Recommended Prerequisites: Aerospace Engineering
- Credits: 1 semester course, 1 semester required, 3 credits per semester, 3 credits maximum
- Counts as a Directed Elective or Elective for all diplomas

AVIATION SHEET METAL II
(55XX)
Aviation Sheet Metal II – This course expands on the knowledge and skills students learn in Aviation Sheet Metal I. Students will gain further knowledge and skills in various techniques of fabricating and repairing aircraft sheet metal structures. Students will apply knowledge of aviation blueprints, making layouts, forming, machining, riveting, drilling and countersinking in the fabricating, repair, and inspection of sheet metal structures. Structural load analysis and assessment of damage, characteristics of aluminum alloys, standard and special fastener installation, and layout and forming techniques are emphasized.

- Recommended Grade Level: 12
- Required Prerequisites: Aviation Sheet Metal I
- Credits: 1 semester course, 1 semester required, 3 credits per semester, 3 credits maximum
- Counts as a Directed Elective or Elective for all diplomas
- Qualifies as a quantitative reasoning course

Locally Developed Pathway

Aviation Sheet Metal

(AAR Sheet Metal Certification)

Indiana College and Career Pathway Plan

Cluster: Transportation, Distribution & Logistics | **Pathway: Aviation Sheet Metal**

Secondary	Grade	English/ Language Arts	Math	Science	Health/PE Social Studies	CTE/Career Preparation Courses for this Pathway		Other Elective Courses for this Pathway	
	9	English 9	Algebra I	Biology	Physical Education World History <u>or</u> Geography History of World	Preparing for College and Careers Introduction to Manufacturing	Introduction to Transportation	Fine Arts	World Language
	10	English 10	Geometry	Physics	Health & Wellness	*PLTW Aerospace Engineering <u>or</u> *Non-PLTW Aerospace Engineering *counts as a Core 40 Science course		Fine Arts	World Language
	11	English 11	Algebra II	3rd Core 40 Science*	U.S. History				
	12	English 12	Math or Quantitative Reasoning		Government Economics	*Aviation Sheet Metal I* *Aviation Sheet Metal II*			

Postsecondary Competencies

Industry Certification: AAR Sheet Metal Certification

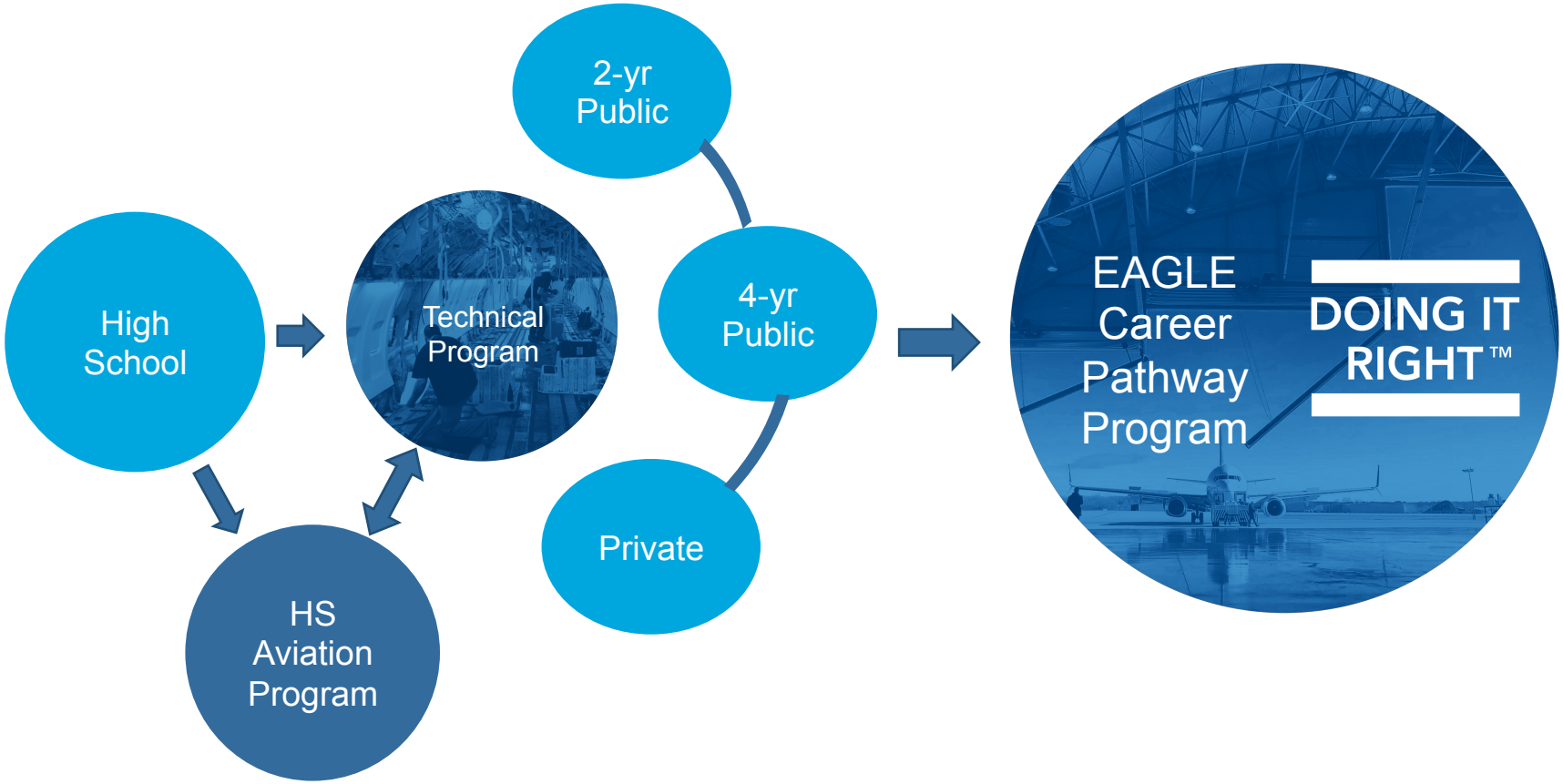
Vincennes University	Career Positions	
AMNT 108 Aircraft Sheet Metal I (4 credits) AMNT 109 Aircraft Sheet Metal II (4 credits)	▪ Sheet Metal Technicians ▪ Structures Mechanics ▪ Aircraft Mechanics and Service Technicians** ▪ Airframe Mechanics** **requires additional training for A&P	▪ Power plant Mechanics ** ▪ Aircraft Engine Specialists ** ▪ Avionics Technicians** ▪ Aerospace Engineering and Operations Technicians **

AAR®
Doing It Right™

AAR EAGLE Career Pathway Program

December 17, 2018

High School to AAR and Beyond



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AAR EAGLE Career Pathway Program

The EAGLE Career Pathway Program is dedicated to growing the talent necessary to meet the maintenance demands of the future with a focus on 5 Core Values:

- Ethics
- Airworthiness
- Greatness
- Leadership
- Engagement

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Pathway Program Details

- AAR selects partner Colleges that provide specific MRO/Airline Training Course in addition to 147
- Student selection criteria developed by AAR
- Students who complete the FAA General curriculum are eligible to submit application into the EAGLE Program
- Student selected will be monitored throughout the rest of their AMT Program
- Students will be assigned a local mentor. Facility visits, job shadowing, meetings, etc.
- Guaranteed interview conducted in last term of school
- General and Airframe or Powerplant Exams completed before starting with AAR.
- Tuition reimbursement to complete A&P certification
- $15k in total tuition reimbursement upon reaching Level I
- Up to $2,000 moving expenses.
- Start with AAR at $15 non certificated or $17 with an A&P

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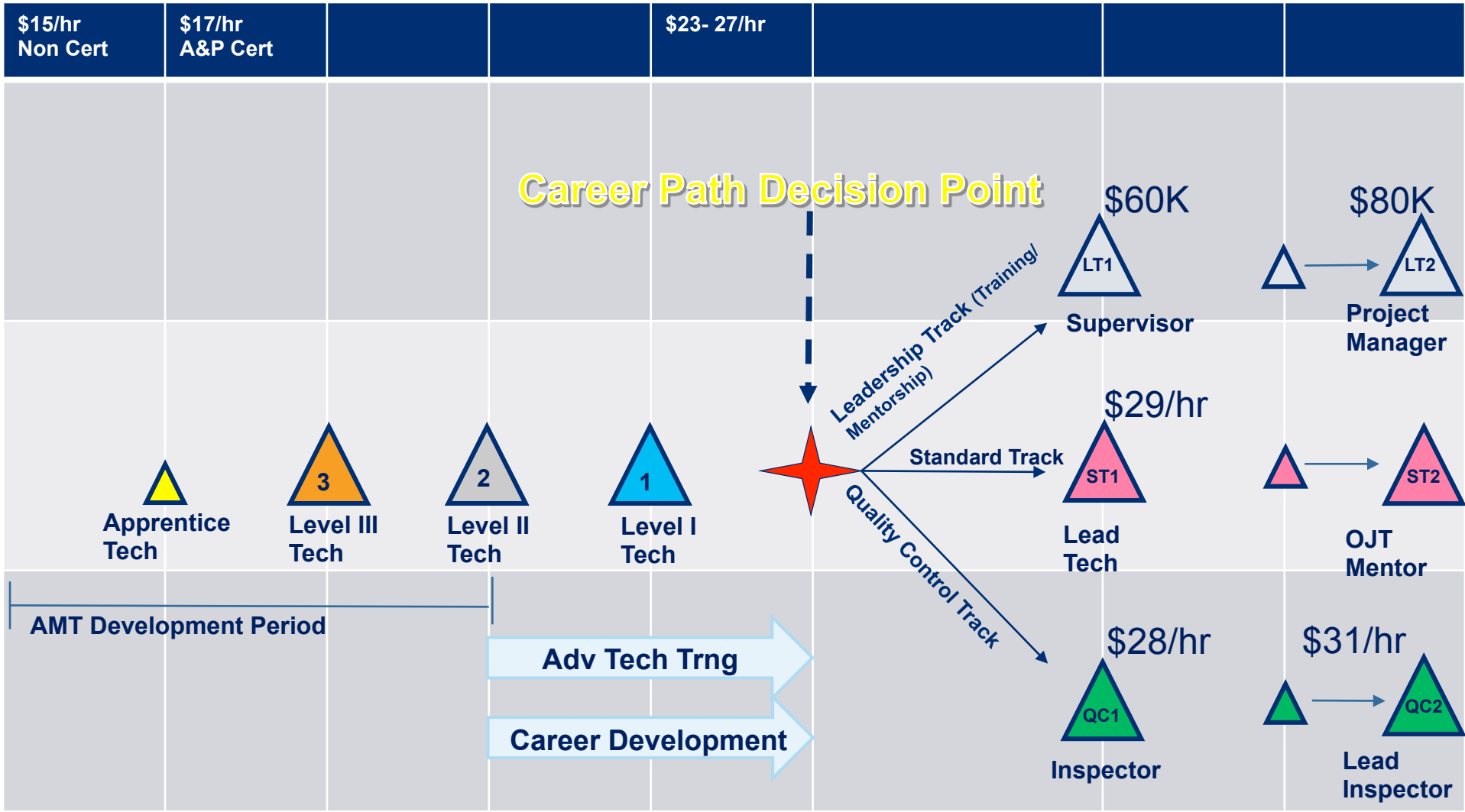
AAR EAGLE Career Pathway Program



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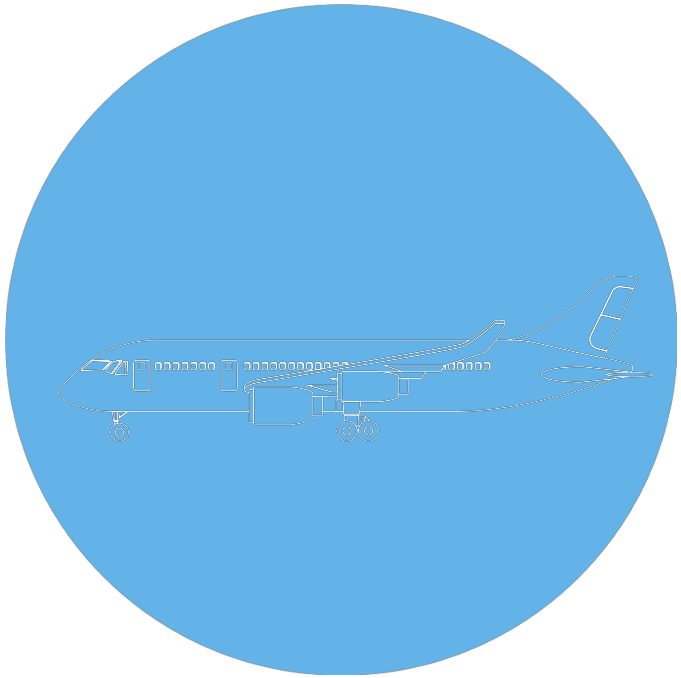
Advanced Qualification Training

- During this phase employees will be exposed to the following:
  - Aircraft Specific General Familiarization Training
  - Customer Advanced Training
  - APRISe
  - StAAR
  - Human Factors / Risk Management
  - Keys to Financial MRO Success
  - Introduction to Leadership
  - Job Shadow
  - Mentorship
  - Strength Development Inventory
  - Regulatory Review
  - Motivation and Teamwork
  - AAR Specific LMS Courses



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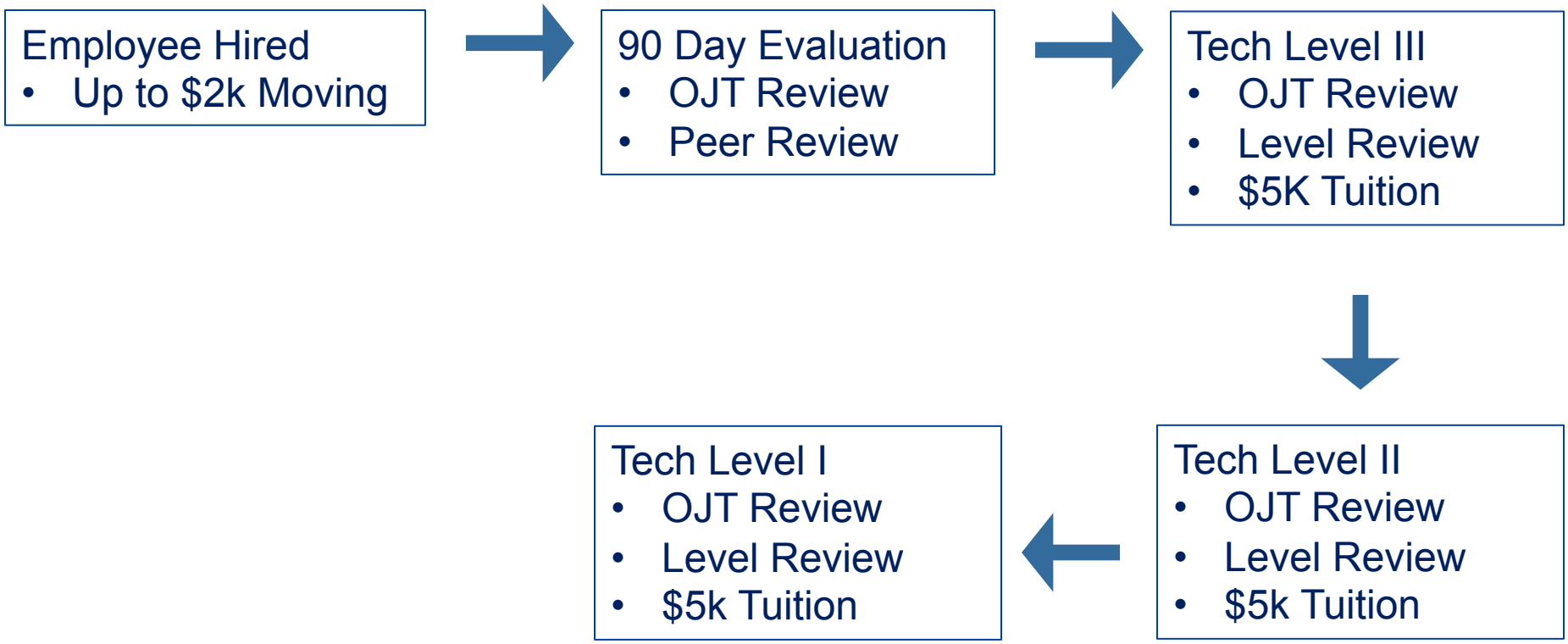
Progression Through The EAGLE Career Pathway Program



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Total Compensation

Level III

Base Salary $37,440 + Tuition $5,000 + Over Time $4,500 + Benefits $9,500 = $56,440

Level II

Base Salary $41,600 + Tuition $5,000 + Over Time $5,000 + Benefits $9,500 = $61,100

Level I

Base Salary $46,800 + Tuition $5,000 + Over Time $5,600 + Benefits $9,500 = $66,900

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Additional Entry Points

- The EAGLE Program was initially developed for students entering AAR from a partner Airframe and Powerplant School.
- However, as AAR expands its short certificate course programs in Sheet Metal and R&E students completing these programs can also fit into the EAGLE framework.
  - The only difference would be the students would not be eligible for the $15k in tuition reimbursement because the cost of these programs are low and can usually be covered by state or federal funding sources.
- This framework can also to be used for veterans entering our workforce based upon years of service.
  - For example: A veteran employee may start at a Level II salary but must accomplish the Level III and Level II OJT programs before going to Level I to provide for adequate documentation.
- Existing employees wanting to move from one level to the next.

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Mentorship Checklist

1. The mentorship opportunities for students accepted into the EAGLE program are critical to developing the student into a successful employee of AAR upon their graduation.
2. It is also understand that each facility may have unique circumstances which require a tailored approach to this process that will allow the flexibility needed to help ensure the most successful outcome for the students.
3. Facilities may choose to hire the EAGLE student as either part or full time Shop Helper or Support Technician. In such cases the student still must complete all aspects of the mentorship program.
4. The mentorship is not paid and is not an internship. The purpose to expose the student to all aspects of the maintenance organization.
5. Then Mentor Checklist must be completed and documented in the Students “EAGLE Application” by HR or the VP of Maintenance Workforce Development.

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Mentorship Checklist

- Students will accomplish the following checklist items while in the EAGLE Career Pathway Program

- ☐ Human Resources
- ☐ Maintenance Training Department
- ☐ Maintenance Operations
- ☐ Ops Meeting
- ☐ Quality Control
- ☐ Quality Assurance and Safety
- ☐ Maintenance Planning
- ☐ Parts Department
- ☐ Lead Job Shadow
- ☐ Inspector Job Shadow

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EAGLE Pathway Universities and Colleges

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Thank You

AAR®
Doing It Right™

Ryan Goertzen
VP Maintenance Workforce Development
Ryan.goertzen@aarcorp.com

aarcorp.com

April 25, 2019

Dear Locally Created Pathway Review Team:

AAR Corp (AAR) is one of three partners collaborating with the Metropolitan School District of Decatur Township to create a Locally Created Pathway for the Aviation industry. AAR is the largest aviation maintenance repair organization (MRO) in the nation and we have a location at the Indianapolis Airport. Vincennes University Aviation Training Center – also located at the Indianapolis Airport is the major training facility utilized by AAR.

As a result of AAR's engagement with Vincennes and Republic Airline on the EWIN grant, we connected with MSD Decatur and Area 31 Career Center. AAR has a high need for aviation maintenance technicians. We were struggling to find a way to create a pipeline of employees into the industry, until we made the connection with MSD Decatur, who could supply the students to be trained.

The Aviation Maintenance – Sheet Metal Pathway provides the necessary training for students to obtain knowledge and skills as well as hands on experience in the lab to learn various techniques of fabricating and repairing aircraft sheet metal structures. This pipeline will provide a continuous supply of technicians who can help shrink the gap currently existing in the workforce. As the graduates go to work for AAR and gain more experience, they will advance through the various levels of technician training and development. Employees can continue their education through Vincennes Aviation Training Center or through experience to obtain their Airframe and Powerplant (A&P) certification.

I endorse the Aviation Maintenance – Sheet Metal Pathway as a locally created pathway for students of the MSD of Decatur Township. We are excited about the opportunity to have a well-trained workforce to employ at our facility in Indianapolis.

Thank you for your consideration of the approval of this pathway.

Sincerely,

Ryan Goertzen
VP Maintenance Workforce Development
AAR Corp

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AREA 31 CAREER CENTER
WHERE PASSIONS BECOME PROFESSIONS

Area31CareerCenter.com • 1200 N. Girls School Rd. • Indianapolis, IN 46214
Phone: (317) 988-7230 • Fax: (317) 988-7298

April 15, 2019

Members of Indiana's LCP Review Committee:

I offer this letter in support of the Aviation Sheet Metal Pathway proposal designed in partnership with AAR Corporation, MSD Decatur Township, and the Vincennes University Aviation Technology Center. There is strong and increasing local demand for entry-level workers in the aviation maintenance industry. Furthermore, career opportunities in aviation maintenance can be found across our state and country. This proposal, which stems from an Education and Workforce Innovation Network (EWIN) planning grant, will allow students to develop the skills and understandings necessary to enter employment.

Students who choose to enter this pathway will benefit from AAR's extensive experience in workforce training as well as Vincennes University's capacity to provide top-notch educational programming. This opportunity will provide local students with an on-ramp into a fulfilling and highly-lucrative professional pathway. I hope that you too will recognize the value that the Aviation Sheet Metal Pathway will provide to local families and our local economy. Thank you for your consideration.

Respectfully,

Patrick A. Biggerstaff, Director

Area 31 Career Programs

Early College Career Center

Adult Education

AAR AIRCRAFT SERVICES
INDIANAPOLIS

Certificate of Training

CERTIFIES THAT

HAS SUCCESSFULLY COMPLETED

AAR Sheet Metal Structures

Hours Completed: *300* CEU's:

Completion Date:

_____

_____

Instructor Name
Systems Instructor - AAR Aircraft Services
& Vincennes University Aviation
Technology Center

MSD OF DECATUR TOWNSHIP

5275 Kentucky Avenue
Indianapolis, IN 46221
P: 317.856.5265
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www.decaturproud.org

April 26, 2019

Members of the LCP Review Committee:

The Metropolitan School District of Decatur Township is excited to submit our Locally Created Pathway for Aviation Sheet Metal. This pathway was created in collaboration with Vincennes University Aviation Technology Center, AAR Corp., and Area 31 Career Center. The concept for the LCP stemmed from the work that all entities were engaged in as a part of an Education Workforce Innovation Network (EWIN) grant.

The MSD of Decatur Township has played a very active role in working toward building a workforce pipeline into the Aviation industry. As part of the pipeline, there is an obvious need to engage students while still in high school, enroll the students in training coursework, and for those students to be employed. The proposed Aviation Sheet Metal pathway provides for all three of these components. One critical factor of the pathway is the time factor in which a student can become an apprentice Sheet Metal Technician at AAR. AAR has an immediate need for qualified workers to continue to fill the maintenance pipeline as their aging workforce retires.

Students who complete this pathway will be able to immediately enter the workforce and they have the option to continue to work toward their Airframe and Powerplant certification at Vincennes University Aviation Technology Center under the Next Level Jobs grant. This pathway is a "win-win," as it puts our students on the trajectory to a lucrative career which will allow them to continue to grow and contribute to the community, and it provides AAR with a much needed, qualified workforce.

Thank you for your consideration of the MSD of Decatur Township's Aviation Sheet Metal Pathway.

Sincerely,

Matthew J. Prusiecki, Ph.D.
Superintendent
MSD of Decatur Township

Republic Airways

Opportunity Elevated

Dear Locally Created Pathway Review Team,

Republic Airways offers its full support for this locally created pathway in aviation maintenance. Headquartered in Indianapolis, Indiana, Republic Airways employs 6,100 talented professionals to support its operations in partnership with American Airlines, Delta Air Lines and United Airlines. We operate 950 daily departures to over 100 U.S. cities, Canada, Central America and the Caribbean. Our outstanding performance and saftey records wouldn't be possible without all of our employees in the air and on the ground.

The impetus for this locally created aviation maintenance sheet metal pathway came out of the work from a grant offered by the University of Indianapolis, Center of Excellence in Leadership of Learning (CELL), Education Workforce Innovative Network (EWIN). This grant provided funding and technical support to a group of local education, business and community partners to research and develop an Aviaiton Maintenance Pathway with multiple on and off ramps for participants. The AAR EAGLE career pathway program and these specific sheet metal courses are components that this group identified to help address the needs of our industry.

According to the 2018 Boeing Pilot & Technician Outlook report, there will be a worldwide demand for more than 750,000 Aviation Maintenance Technicians between 2018 and 2038. The need for aviation maintenance technicians industry wide is especially crucial because demand is expected to begin outpacing supply in the next five years, then steeply increase between 2023 and 2027. This past year Republic Airways hired 111 maintenance technicians with a starting salary of $20/ hour.

With the clearly documented need for additional aviation maintenance technicians in our industry, Republic Airways is in full support of this locally created pathway. We believe this entry pathway opportunity for high school students to be introduced and trained as aviation sheet metal technicians will help inspire the necessary talent pipeline of qualified airframe and powerplant mechanics to continue our maintenance operations in Indiana. Therefore, we hope you will recognize and approve this locally created pathway. It not only will help support Indiana's robust aviation industry, but also create new and exciting opportunities for our local students to have meaningful and fullfilling careers.

Sincerely,

Martin Kirkwood
Director of Career Pathways

8909 Purdue Road, Suite 300, Indianapolis, IN 46268 ★ 317-484-6000

VINCENNES
UNIVERSITY

Aviation Technology Center
AviationTechCenter.com • Phone: 317.381.6000 • Fax: 317.381.6060

April 26, 2019

Dear Locally Created Pathway Review Team:

Vincennes University has collaborated with the Metropolitan School District of Decatur Township to design and create a Locally Created Pathway for the Aviation industry. This pathway includes training for students through Vincennes University Aviation Technology Center on Aircraft sheetmetal. Students will take coursework at the Aviation Technology Center (ATC) at the Indianapolis Airport. The two courses are specially designed for fabricating and repairing aircraft sheet metal structures.

Vincennes Aviation Training Center is uniquely situated to provide specialized training for aircraft maintenance. The partnership with MSD Decatur Township expands on an existing relationship with Area 31 Career Center and connects to an existing partnership with AAR Corp. This Sheetmetal Pathway allows students to specialize in a facet of aircraft maintenance and with the acquired skills, proceed directly into the workforce with employers such as AAR Corp. We want to provide students an opportunity to establish an initial engagement in the aviation industry, experience success in training, earn a certification, and land a job. It is our hope that students will want to advance their career with additional training, returning to ATC to pursue the FAA approved Airframe and Powerplant certification, and ultimately earn an associate's degree from Vincennes University.

We are in support of the Aviation Sheetmetal Pathway as a locally created pathway for students of the MSD of Decatur Township. We look forward to working with Decatur Township students as they learn and demonstrate valuable skills needed in the aviation industry.

Thank you for your consideration of the approval of this pathway.

Sincerely,

Michael D Gehrich
Director of Aviation
Vincennes University

2175 South Hoffman Road, Indianapolis, IN 46241