



Aviation Pathways

A Continuum of Programs and Training

Designed to Prepare Hawaii Youth for a Future in Aviation



Aviation Pathways – Setting the Stage

- Sixty-five percent of Hawaii’s 284 public schools are Title I schools with large concentrations of low-income students
- Many Hawaii students graduate inadequately prepared for and in many cases unaware of STEM career paths, threatening their ultimate economic health and well-being
- Research indicates K-12 STEM education contributes to higher levels of student interest in STEM fields, especially after participating in hands-on, relevant activities. Effective STEM education is a vital part of the solution
- Locally, nationally and globally, there remains a pressing shortage of pilots, aircraft mechanics, aviation engineers
- These high-paying, STEM professions are available right here in Hawaii yet the pool of applicants remains sparse

Inspiring and Preparing Hawaii Youth For Employment in the Aviation Sector

Pearl Harbor Aviation Museum (PHAM) facilitated meetings in 2019 and 2020 with community stakeholders including Workforce Development Council, the Department of Education (DOE), Aircraft Owners and Pilots Association (AOPA), the Federal Aviation Administration (FAA), Civil Air Patrol (CAP), Hawaii Community College (HCC), Hawaiian Airlines, and more, to discuss how to address the issues (detailed below) that block aviation career pathways for Hawaii youth:

- Lack of programs to guide youth toward careers in aviation/aerospace fields;
- Constraints on education and training opportunities stemming from a decline in vocational training in high schools and the shortage of A&P Instructors and CFIs; and
- High cost of schooling/training.

Outcome of the meeting – PHAM outlined an “Aviation Pathway” and explored the development of informal learning opportunities that could:

- Increase awareness for Aviation / Aerospace Careers
- Inspire interest and participation in aviation focused programming
- Develop partnerships to immediately address education and training



Elements of Aviation Pathways

1. **Awareness** – Discovering Flight, introduction of aviation history and heroes into 2nd – 6th grade classrooms, inspiring career awareness and interest
2. **Education** – offering two levels of educational experience:
 - a) Museum / Campus field trips incorporating an experience the Museum’s newly opened Aviation Learning Center
 - b) Classroom and Museum introduction of nationally acclaimed aviation curriculum addressing both Pilot and Unmanned Aerial System (Drone) career opportunities
3. **Training** – exploring opportunities in the following areas:
 - a) Ground School opportunities
 - b) Aviation Mechanics programming and internships
 - c) Scholarships for flight training



1. Awareness - Discovering Flight

- *Discovering Flight* is a three-part program that includes the Junior Collier Award, [Why I Fly films](#), and a [full STEAM-based curriculum of standards-aligned media, interactives, lesson plans, and more](#) designed to not only advance key STEAM concepts but to also promote understanding of the practical wonders of flight and encouragement to imagine themselves discovering America's remaining air and space frontiers
- Developed by the following partners: The National Aviation Hall of Fame, Emmy Award-winning aviation documentarian filmmakers, [Hemlock Films](#), the [National Air & Space Museum](#), the [National Aeronautic Association](#), and [PBS](#), the nation's leader in early childhood education. The curriculum portion of *Discovering Flight* is activity-driven
- Introduced at no cost to schools during this first year, PHAM will share this curriculum with schools across the state, targeting grades 1st – 6th grade
- In the classroom, students will join Will and Orv as they transcend time to interact with other famous aviation and space leaders from history to deliver fun, educational experiences for the classroom. The curriculum folds in components that foster an appreciation of the nation's extraordinary aviation legacy by honoring the exceptional individuals who led the way
- The program, designed to meet education requirements/standards at multiple levels, offers 5 hours of educational experiences and content. Following completion of the series, students/classrooms will be encouraged to visit the Pearl Harbor Aviation Museum as the culmination of their learning



2. Education - Aviation Learning Center

Installed into a completely restored, authentic, WWII pilot training center, the ALC is located on the PHAM grounds.

Since opening in January, 2002, nearly 4,000 Hawaii Youth from all islands have experienced the impact of this unique, interactive learning environment.

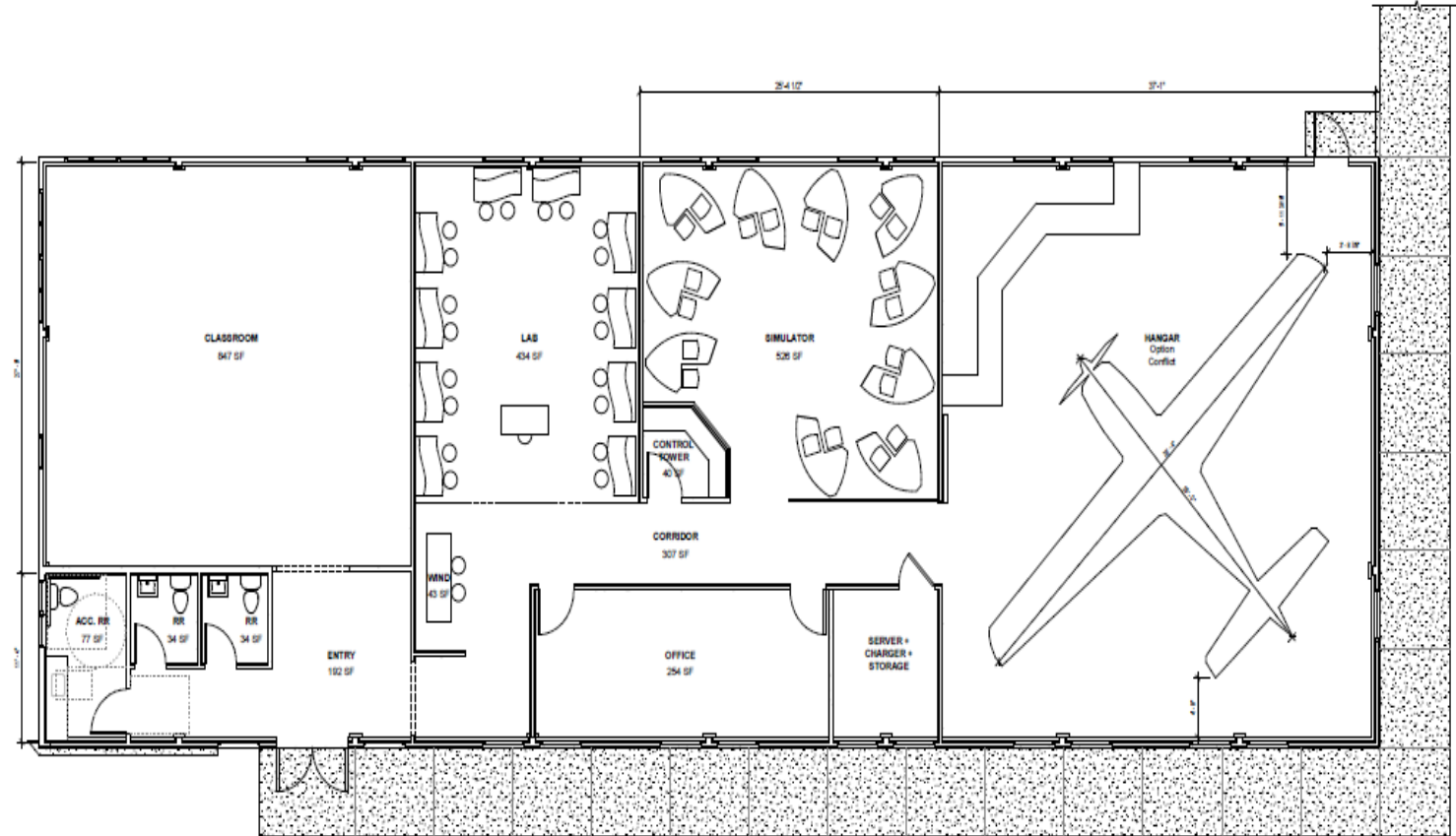
Nationally developed educational modules address state and national STEM standards, using hands-on aviation challenges to enhance learning. Teachers receive supporting instructional materials and training strategies

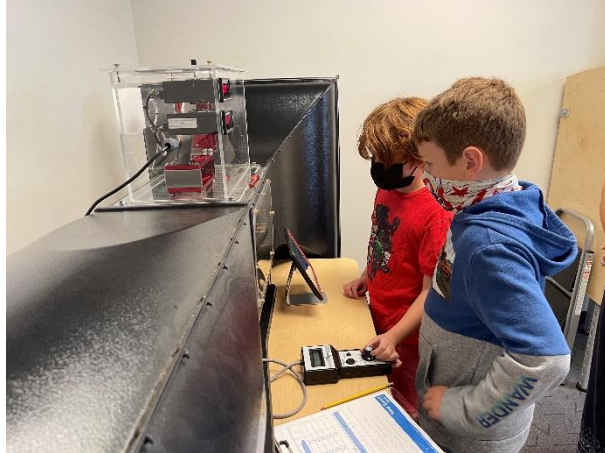
The ALC consists of:

THE LEARNING LAB

THE HANGAR – Cessna 152 installed

THE SIMULATOR BAY – flight simulators





Above: Youth working in the **Learning Lab**, exploring the principles of flight and the core competencies to execute a safe flight; Youth working in the **Hangar** to chart a planned course for an upcoming flight and preflight the aircraft.

Below: **Simulator Bay**, Flying their mission.



2. Education - AOPA High School Aviation Curriculum

Introducing the Aircraft Owners and Pilots Association (AOPA) High School Aviation Program to Hawaii schools, a six-course, two-pathway (pilot and unmanned pilot) [high school aviation STEM Curriculum](#)

- Curriculum - written by former high school teachers, administrators, and curriculum development specialists, is a [STEM.org](#)-reviewed educational media and provides career and technical pathways for two careers – Pilot and Unmanned Aircraft Systems (Drones)
 - Key attributes include:
 - Comprehensive four-year aviation study aligned to Common Core State Standards, Next Generation Science Standards, and FAA Airman Certification Standards (ACS)
 - Teaches STEM through the lens of aviation by engaging students in project-based learning, engineering design challenges, and engineering experiments
 - Prepares students to earn Career Technical Education (CTE) stackable credentials such as the FAA Private Pilot Knowledge Test, FAA Remote (Drone) Pilot Knowledge Test, and FAA Remote Pilot Certificate
 - Guides students through CTE-related experiences, career portfolio development, business plan writing, and semester-long CTE capstone projects
- Each course provides all instructional and assessment resources needed to provide rigorous and engaging problem-based learning experiences
- All material delivered online with available support from local flight instructors
- Adopted and in use in 43 states, within 400 schools – delivered at no cost to the Schools or Sponsoring Organization
- Delivers opportunities to link with aviation and aerospace providers throughout the community through field trips and other immersive opportunities. Extending the learning environment outside traditional classroom walls to the airport and beyond makes aviation tangible to students and opens students' eyes to aerospace STEM careers

2. Education - AOPA High School Aviation Curriculum

Curriculum Facts At-A-Glance -For the 2021-2022 school year:

- More than 400 schools in 43 states offered over 1,000 class sections of AOPA Curriculum-based instruction to 12,000 students
- The Curriculum reaches populations historically underrepresented in aviation, with 40% students of color and 21% female students
- Students achieved nearly 1,600 aviation milestones, including 1,087 starting flight training, 134 completing their FAA Private Pilot Written Exam, 50 earning their FAA Private Pilot Certificate, 305 passing their FAA Part 107 (drone pilot) Written Exam
- The program graduated 1,152 students in its first year of full, four-year implementation.
 - 75% of graduates intend to pursue postsecondary education
 - 58% of graduates intend to pursue an aerospace-related STEM career, including 21% of graduates who intend to pursue a career as a pilot
- Multiple states have approved the Curriculum for use as Career and Technical Education (CTE) pathway courses
- Some states, such as Oklahoma, allow students to use AOPA Foundation classes for core academic classes toward graduation
- Sixty-three colleges and universities across 21 states offer articulation agreement or dual enrollment credit for AOPA Foundation courses



AVIATION JOB POSTINGS CONTINUE TO SOAR

"602,000 new pilots, 610,000 new maintenance technicians, and 899,000 new cabin crew members will be needed to fly, and maintain the global commercial aviation fleet over the next 20 years."

This forecast is limited to the commercial aviation sector, and assumes that air traffic demand will recover to 2019 levels by 2024.

Source: Boeing Pilot and Technician Outlook - 2022-2041: www.boeing.com/commercial/market/pilot-technician-outlook



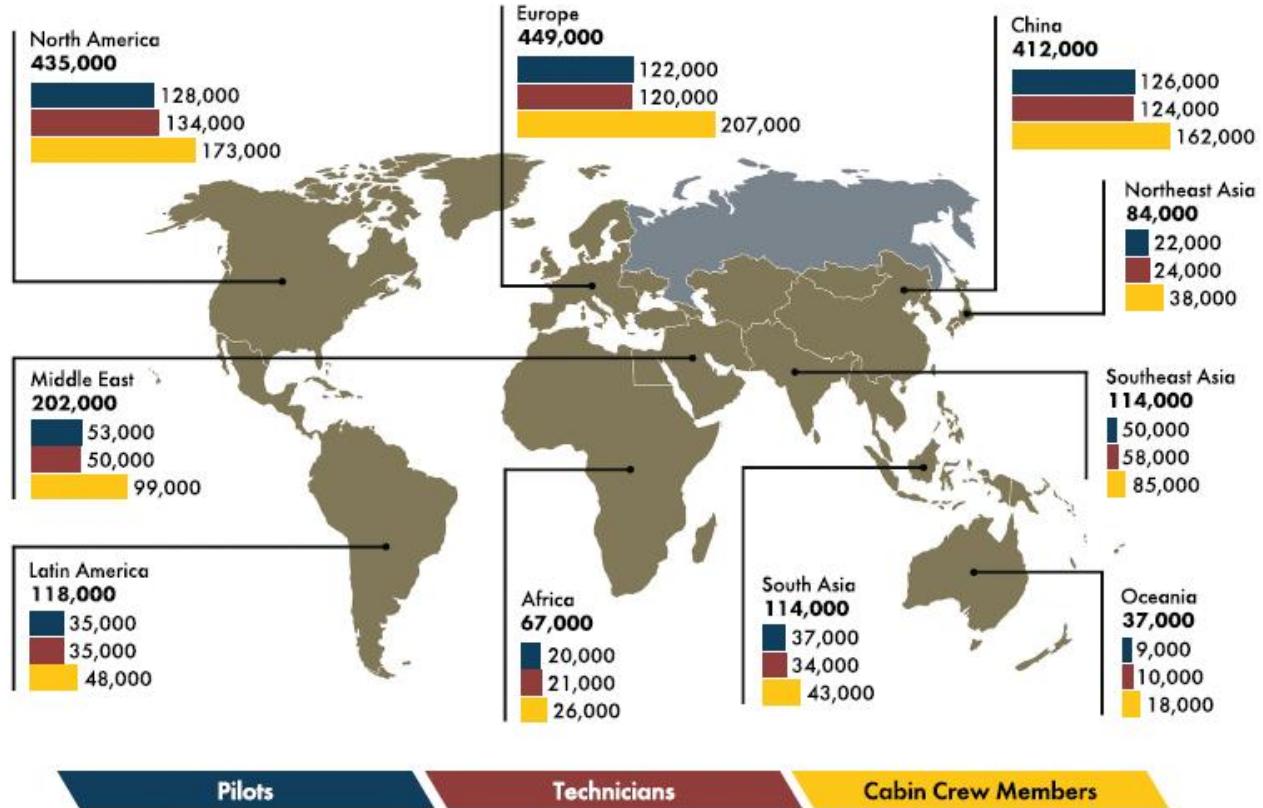
602,000 New Pilots



610,000 New Technicians



899,000 New Cabin Crew



\$208,000

The median salary for airline captains, first officers and flight engineers in the United States is **\$208,000** as of 2022.

Source: U.S. Bureau of Labor Statistics: [https://www.bls.gov/oes/current/oes532011.htm#\(2\)](https://www.bls.gov/oes/current/oes532011.htm#(2))

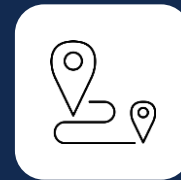
PEARL HARBOR
AVIATION MUSEUM
AVIATION PATHWAYS

AOPA Foundation High School Aviation STEM Curriculum

Four-year STEM curriculum in Pilot and Unmanned Aircraft Systems pathways



High-demand aerospace
careers



Industry-recognized stackable
credentials



Built for teachers by teachers
and pilots



Rigorous, comprehensive,
and FREE

AOPA Foundation's Commitment to You

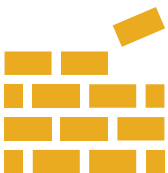
FREE

Our donors help keep the program free

- Teacher training
- Program planning and support
- Continuing education units from ERAU
- Ongoing teacher and program support
- State course approval support
- Networking opportunities




Pilot and UAS Pathways




Grade 9 Course Topics
Introduction to Aviation
Aerospace History
Engineering Design




Grade 10 Course Topics
Forces of Flight
Aircraft Systems
Aircraft Performance




Grade 11 Pilot Course Topics
Weather, Airspace
Flight Planning



Grade 12 Pilot Course Topics
Instrument Flight
Advanced Aircraft
Future of Aerospace



Grade 11 UAS Course Topics
Weather, Airspace,
Drone Operations



Grade 12 UAS Course Topics
Advanced Missions
Advanced Drone Tech
Future of Aerospace

Key Features of the Lessons

Learning Goals



Depth of Knowledge

5-E Lesson Format



National Standards

Easy Access



Assessments

3. Vision for Training

- **Ground School – Under Development**
 - Work with CAP and other aviation-focused programs, to host Ground School at the Aviation Learning Center
 - Provide mentor support to ensure success
 - Prepare students for FAA written exam
- **Mechanics training – Under Development**
 - A collaboration with PHAM restoration shop employees (and volunteers), private sector certified Airframe and Power Plant (A&P) mechanics (airframe and power plant), CAP and HCC (Hawaii Community College A&P program) to provide interested students with the following:
 - Open opportunity to learn about the skill trade and participate in hands-on activities
 - Provide career readiness – provide orientation type activities that deliver high level understanding of the skills and abilities required to work aircraft maintenance; hands-on engagement in some basic aircraft repair work – historic aircraft restoration and maintenance of museum display aircraft. Collaborations with local airlines, airports, and professionals in engineering, piloting, maintenance, technology fields that align
 - Initiate an A&P mentor program – working with a licensed A&P mechanic within the museum restoration area to gain transferable skills that could lead to an A&P certificate
- **Aviation Club –Under Development**
 - Build out special programming after school and on weekends that tie all these programs together and provide interested and motivated students with a family of support



3. Vision For Training

- Apprenticeship Opportunities – Aviation Mechanics – Under Development

Scholarship Support to support Training -

- Scholarship – Current Offer:
 - Academic and training scholarships offered annually to a national-applicant pool supporting career advancement, specialized training, and registration / tuition support. Competitive process includes an application and review cycle that begins in November and concludes with scholarship awards in June – awards range from \$500 - \$10,000
 - Total award pool ranges from \$20,000 - \$40,000
- Scholarship – Under Development
 - Ray Foundation Scholarship – part of the Aviation Pathway Vision, PHAM will award a total of \$200,000 to Hawaii youth aged 16-21 each of the next 3 years to support flight training



How Can You Help as a Corporation, Organization, or Educational Center:

- Invest Funding to support:
 - Staff – hire, develop, train required staff
 - Resources - develop required classrooms, A&P training facility and equipment and more
 - Complete all “Under Development” initiatives
- Provide In-kind support or “loan” of professionally employed aviation mechanics, pilots, engineers and others involved in aviation careers. Airline, military, aerospace corporate personnel support to augment evening and weekend programming
- Navigate opportunities and requirements within DOE to integrate CTE opportunities to support staff development - PHAM will ensure that at least one of our full-time education team has the DOE teaching certification to allow for “shadowing” in core skills areas that might lead towards certificate programs
- Identify matriculation or next step pathways for students involved in the Museum’s initiative – post secondary training and education options such as Honolulu Community College (HCC) Aviation Mechanics Program or similar path for piloting
- Explore collaborations with groups (list below) to both diversify the pathway options and to ensure the long-term sustainability of the project.
 - A&P training and apprenticeship with Hawaiian Airlines
 - UH Hilo pilot training program
 - Embry Riddle
 - National Guard
 - University of Hawaii ROTC program
 - HCC Aviation Mechanic program
 - West Mech and other apprenticeship models

