

AVIATION HIGH SCHOOL

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Looking Forward: The Future of America's Aviation Maintenance
and Manufacturing Workforce

Statement of Aviation High School
before the
U.S. House of Representatives Aviation Subcommittee
of the
Committee on Transportation and Infrastructure

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Testimony by Mr. Steven R. Jackson, Principal, on behalf of
Aviation High School, Long Island City, Queens, New York

Chairman Larsen, Ranking Member Graves, and distinguished members of the Subcommittee, thank you for calling this important hearing and thank you for the invitation to testify on behalf of Aviation High School. We are very honored to be included with Vaughn College, Delta Air Lines, Gulfstream, and Republic Airways to provide our insights on the future of America's aviation maintenance and manufacturing workforce.

Futures are built and Aviation High School in Queens, New York, is a very special place where this happens. Officially, known as Aviation Career and Technical Education High School, it is a New York City public high school that was founded in 1936 with the mission of training aviation maintenance technicians at the high school level. The school is in close proximity to JFK International, LaGuardia, and Newark Liberty International Airports, the Northeast aviation sector, and the overwhelming majority of the technicians at these airports were trained by Aviation High School or Vaughn College. We are one of the largest Federal Aviation Administration (FAA) certified Part 147 Aviation Maintenance Technician Schools in the nation and one of only a handful of high schools in the nation that provide students with the ability to earn their airframe and powerplant technician licenses—licenses that allow our students to get jobs building and maintaining aircraft for the civil and military aviation industry. Our students can earn one license in four years and their second license in our competitive fifth year program. As a Part 147 school the certification process is extensive; the FAA must approve our curriculum and they conduct regular oversight of our facilities, processes and procedures to ensure we continue to comply with FAA regulations. Our school is one of 176 FAA-certificated

maintenance schools across the United States. While we are part of this larger community, our school is unique in several ways. Nearly all the other maintenance schools are colleges and technical schools, meaning our graduates are eligible to take the FAA mechanic test at a much younger age. And because we are a public high school, the education is free to our students.

Our students learn and work in multi-period aviation maintenance courses from their freshmen year through senior year. Our students also take the traditional academic, arts, language and physical education courses that New York State requires of all students in order to earn a high school diploma. Simply put, Aviation High School students are pulling double duty—they are simultaneously working on their high school graduation credentials while also working on obtaining their airframe and/or powerplant licenses with the hopes of entering the aviation field, attending a variety of college programs or enrolling in the military. Over the course of our 84 years in existence we have trained a great many of the technicians in the industry, with approximately 11 percent of the nation's technicians currently enrolled in our program. Moreover, there are approximately 20,000 students currently enrolled in certificated aviation maintenance programs in the United States. Aviation High School educates one out of every 10 of those students. We enroll more students than any other single aviation program and our alumni span the globe. Last year, 263 students earned their airframe and/or powerplant licenses through our program.

While Aviation High School has a very high rate of success recruiting students into our program, across the nation schools are struggling. As a community, aviation maintenance technician schools have the capacity to enroll 35,000 students, yet Part 147 schools fill just over half of those seats. At the same time, a Boeing forecast projects that our growing industry will need 193,000 new technicians over the next ten years in North America alone. As a high school that receives over 4,000 applications for an incoming class of 500 students one would guess that a large percentage of our recent graduates go into the workforce directly upon graduation, but this is not the case. In this area we find that our experience as a Part 147 aviation maintenance high school provides us with important insight into the various reasons why teenage students and their parents may choose to attend a school such as ours, but possibly not enter the workforce immediately upon graduation. It has been our experience that middle school students and their parents choose our school for a great variety of reasons such as the quality of our aviation maintenance and academic coursework, school safety and environment, potential for learning a highly-skilled trade and the overall high regard that residents of the City of New York have for our school. As a high school we face the challenge of not only providing students with a well-rounded academic and technical program, but we must also teach our students about the aviation industry and the many jobs that are available to aviation maintenance technicians today. Conversely, the challenge is that from the moment of their child's birth parents envision a college and university path for their sons and daughters that will typically prepare them to become a well-paid, highly regarded doctor or lawyer, not necessarily an aircraft technician. It is our belief that this mindset creates barriers for many younger people and their parents to envision their children working in the field of aircraft maintenance.

Though this may be the case we find that we are typically successful in educating our students on the realities of work in the aviation industry through the real-world experiences that our teachers provide to our students. This sharing of real-life experiences provides our students with more opportunities upon graduation than your typical high school. It must be noted that our aviation maintenance staff are largely made up of graduates of our school and use their time with the students to share their industry work experiences and motivate them to enter the aviation industry.

Aviation High School is located in the most diverse county in the nation: Queens, New York. Our student body is made up of high school students ranging from ages 14 to 19 from all five boroughs of New York City. It is a highly sought-after program for students and parents looking for a high school that provides the training and preparation for students to start a lucrative career after high school or to go onto a college or university program. The student body is comprised of 46% Hispanic/Latinx, 37% Asian, 9% White and 4% Black students, 21% of our student body are women, 14% are students with disabilities and 67% of the student body is facing economic hardships in their home life. Additionally, a majority of our students are first generation Americans whose parents have brought them to the United States to gain better educational opportunities and a better quality of life. The diversity, focus and motivation that our students bring to school each day, as well as the dedication and hard work of their teachers, helps create a welcoming and supportive environment for all students as they work through the rigors of a Part 147 program that is traditionally taught at the college or post-high school level. As a result of the efforts of our students and staff, 96% of our students graduate on time within their cohort and approximately 40% of each graduating class earns their airframe and/or powerplant licenses, and each year we estimate that approximately 10% of our students go into the aviation maintenance workforce not long after graduation, with many also attending college at the same time.

We know this Subcommittee wants to understand how to help our nation fill the many aviation maintenance technician positions that are now available in order to maintain a vibrant aviation industry. At Aviation High School, we see that exposure to the world of aviation at a younger age is key—much younger than even where our high school program begins. Fewer and fewer students are exposed to mechanical work—they do not work on their bikes, or tinker with their cars with their families. Our goods are becoming more digital and when they break, they are more easily replaced than repaired. We believe very strongly that the current STEM models in education overwhelmingly provide the rigorous math and science coursework for our elementary and middle school students, but that these courses also need to provide students with more hands-on practical projects so that they figure out at a younger age that they would like to learn how systems work together or troubleshoot the solutions for fixing and improving the system they are working on. Incorporating more hands-on projects at the middle school level along with the very important marketing and messaging that the industry should incorporate into their advertisements and promotions will help younger generations of students choose the path of working on the various aircraft that are flown throughout the world. As a school community we also

debate the idea that technicians, who were once known as mechanics, would be better represented and marketed as a career if they were to be known as aircraft engineers. By rebranding aircraft maintenance and repair as an official engineering career path we believe that many more young people would set their sights on entering the aviation maintenance field, whether they are teenagers or young adults.

Another important aspect of our program that provides many of our students with the exposure to the inner workings of the industry and helps to enhance our students' skillset is the close relationship and partnerships that we have with the commercial airlines that operate in the New York City area. Aviation High School has official partnerships with Delta Air Lines, JetBlue Airways, British Airways, and others, as well as numerous maintenance, repair and overhaul (MRO) companies, such as Panasonic Avionics, which provide many of our students who are working on their second FAA license with internship work-based learning opportunities at their hangars and maintenance facilities. To help with this school-industry partnership we are fortunate enough to have a partnership with the Port Authority of New York and New Jersey who has provided us with classroom and ramp space at JFK International Airport where our students work in their classroom, participate in their internships after class, as well as complete their aviation coursework on a Boeing 727 that FedEx donated to our school. This airport classroom is in addition to the main campus that includes 34 aviation maintenance labs and on-sight hangar that houses our 11-small aircraft.

We are very fortunate that we are here today with two of our partners, Delta Air Lines and Vaughn College. It is important for programs like ours to have clear pathways for our students to learn from technicians in the field on real aircraft, as well as college programs that allow them to use their aviation maintenance training and apply it to the many related career fields that are available to them throughout the industry, such as air traffic control and flight training. These additional pathways help to motivate our students and provide them with that additional inspiration to work towards their various aviation interests. We are very fortunate to work so closely with Delta Air Lines as we gain their feedback on how to improve our students' technical aptitude and with Vaughn College to learn from their experiences at the collegiate level.

These opportunities add to the knowledge base and skills acquisition that our students receive beginning in the ninth grade, and the internships are an important way for our partners to engage with and help train the next aviation maintenance technicians graduating from our school. As one can imagine, maintaining and operating a Part 147 school that works to create real-world experiences for our students also creates a heavy price tag for our local educational system to fund, and we are very appreciative that Congress has allocated federal funds to support aviation maintenance schools and it would be extremely helpful if Part 147 schools received the additional allocations as soon as possible so that we can continue to improve our students' technical training for the 21st century workforce.

We believe that such partnerships and accompanying internships help increase the number and improve the quality of aviation maintenance technicians trained in the nation. We believe that these experiences need to be expanded and incorporated into schools at an earlier point in our students' educational experience. Currently only students 18 years or older can gain access to work-based opportunities on our nation's airports. To improve such access for high school students, this would require the FAA, industry partners and aviation maintenance technician schools to work more closely together to not only provide more flexibility to allow schools to adapt to the changing aviation technology, but to also create a pathway where more students can earn student apprenticeship type clearance to learn and work alongside certified, experienced aviation maintenance technicians at an earlier age. Ideally it would be wonderful if high school students, such as ours, were provided with on airport, on-the-job experiences with the guidance of the partnering company to help train students for the specific type of job openings available in a school's surrounding area. These earlier connections between school and industry would also create those marketing opportunities for younger students to see the exciting work they could do in a high school that trains aircraft engineers.

This infusion of industry training into aviation maintenance schools at an early point in a child's educational experience, both at the elementary and middle school level, would also benefit from the introduction of more flexibility and modernization of curriculum for schools to address the FAA Part 147 regulations that would help them align their coursework to the needs of the industry in the geographic location of each school, whether that means alignment with general aviation, commercial and cargo, manufacturing or MRO jobs that are available in that area of the country. To that point we support the Promoting Aviation Regulations for Technical Training (PARTT) 147 Act ([H.R.5427](#)), the Mechanic Aircraft Certification Standards, and removal of seat time requirements that ATEC has submitted for review to this subcommittee. The Promoting Aviation Regulations for Technical Training (PARTT) 147 Act—is a bipartisan and bicameral bill that is awaiting action by this committee. The bill calls for the FAA to revise the current training mandates, something industry has long called for. While the regulation is currently in rulemaking agency, timelines suggest we will not see a modernized rule until at least 2022. Therefore, we ask Congress to support HR 5427, which would give schools like ours the flexibility to better educate our students and prepare them for today's high-tech jobs in aviation.

We appreciate this Subcommittee's interest in the future of aviation and a desire to address the technician shortage. Furthermore, the community deeply appreciates this body's efforts to support aviation technical education by making workforce a central theme in the 2018 FAA reauthorization, providing updated maintenance workforce data, urging Congress to use its oversight authority to ensure FAA initiates funded grant programs, and urging action on proposals like the PARTT 147 Act and the Promoting Service in Transportation Act ([H.R.5118](#)), which would help raise aviation career awareness. Our belief is that the future is built upon programs like Aviation High School, on quality, well-rounded education that exposes young students to STEM and mechanical training at early ages, and

the practical, hands-on partnerships and connections with the FAA and the aviation industry.

At Aviation High School we have a great wealth of experience and expertise in navigating the challenges of training young students to become aircraft engineers. Our aviation maintenance staff is made up of two assistant principals, Mr. Mario Cotumaccio and Mr. Giovannie Sosa, and 48 FAA airframe and powerplant certified high school teachers. Members of our aviation maintenance staff helped to develop the ideas and suggestions that are presented in this testimony and Mr. Cotumaccio, an Aviation High School graduate and aviation maintenance technician with over 35 years of experience as a technician, supervisor, teacher, FAA liaison, Designated Mechanic Examiner and administrator, summarized our core suggestions into six main points based on his years of expertise in the field of aviation education for your consideration as described below.

The best solutions to the problems plaguing the airline industry, specifically the shortage of aircraft technicians, involve a multifaceted approach. Our proposed strategy relies heavily on the ability to join all the parties involved in the aviation industry: the party that governs the industry, the FAA, the party that is responsible for educating the industry, training institutions like Aviation High School, and the party that hires them, our beloved partners in the sky. Hopefully as our committee grows, we will be able to include the labor unions in the abovementioned approach, as the labor unions work hand-in glove with industry.

We at Aviation High School, have created a comprehensive strategy to address the shortage of aircraft technicians and have outlined each step into six key parts:

1.) Increase Outreach to Focus on Early Education: Elementary School, Middle School & High School Level - Children today do not grow up hearing their parents' desire for them to become an aircraft technician; they are often encouraged to enter the medical, law or engineering professions. The best opportunity for a child (and their parents) to discover a different career path is through early exposure. The current period of exposure to the aviation industry for future aviators is high school; high school is much too late. It is crucial we develop programs and opportunities that introduce the amazing world of aviation to elementary, middle and high school children.

Elementary: We believe in the STEM model, and we are eager to see elementary schools infuse an aviation-based STEM model that provide students with an opportunity to learn about the aviation industry, hands-on. Engaging elementary students, early on, with *Aviation Work-Based Learning Projects*, will encourage students to participate in trouble-shooting, problem solving, and improving, actual job issues that arise on aircraft or within the aviation industry. In addition, the introduction of *Aviation Work-Based Learning Projects*, nourishes the students' fine motor skills; industry educators and leaders are seeing a decline in the ability of our high school students to operate basic tools (screwdrivers, wrenches, etc.), when needed

to complete tasks, which is quite often. At a time where our youth are being over-stimulated and distracted by all things “smart”, there must be a focus on the importance of utilizing their hands. Furthermore, the introduction of *Aviation Work-Based Learning Projects* initiatives at the elementary school level, will raise awareness to new opportunities that will supplement their curriculum.

Middle School: Industry partners are asked to invest time and resources to build programs that will sustain schools by creating outreach programs; these outreach programs will enable students to interact with real industry professionals. By exposing our students to a network of industry professionals, these mentors can provide opportunities for on-site job visitations, typically only made available when a student acquires an internship at the high school level. Together with implementing advanced *Aviation Work-Based Learning Projects*, outreach programs must also start earlier on than high school. There is also a tremendous emphasis on targeting these outreach programs to the communities that are underrepresented in the industry, encouraging diversity within our student population. Lastly, these programs will support and raise awareness of the plentiful and lucrative career opportunities available within the aviation maintenance industry.

High School: As stated above, Aviation High School, has official partnerships with such airlines as: Delta Air Lines, JetBlue Airways, British Airways, and Panasonic Avionics. Our internship programs have earned Aviation High School national recognition and serve as a model to demonstrate how important collaboration is. When school, community, and industry work together, a stronger America is built! We believe that at an earlier point during a students’ educational experience, our partnerships and internships need to be expanded and incorporated into schools nationwide. Industry experts have focused on the need to bridge the gap between the present-day CFR Part 147 curriculum and the technologies associated with today’s modern-day aircraft. Internship programs help overcome this problem by placing future aviators in advanced modern-day learning environments, along with professional mentors. As a result, interns will become more knowledgeable on the functions of an organization, and they will also gain a more thorough understanding of the skillset needed for this type of career. Furthermore, most airline partners today, will require a minimum of 12 to 24 months of experience before even considering an applicant. Through an internship, a student not only increases their knowledge and experience on modern-day aircraft, but they also increase their communication, organizational and teamwork-building skills that are so critical in today’s job market.

2.) Improve the Perception & Marketing – An aviation maintenance mechanic has evolved beyond being branded/categorized as unskilled labor as per the US Department of Labor. Troubleshooting a Boeing 787 requires an individual with advance training, whom has the ability to: analyze symptoms, read and interpret sophisticated wiring diagrams, use complex tooling, and test equipment in order to determine the root of the problem. In addition, the

individual must document the maintenance performed, which requires utilizing FAA approved language. Also, it is important to note, the individual paperwork associated with each repair is scrutinized and regulated by strict FAA protocols, where monetary fines or suspension of certification may be imposed to the individual if not properly performed. Drug testing is also mandatory and felony convictions are disqualifying factors when applying for employment. Lastly, the responsibility of each passenger's life at 35,000 feet above sea level, places an enormous stress on the individual.

In addition to being classified/branded as an unskilled labor, the perception of the aviation mechanic is a hotly discussed item. Within the industry, we often debate the titles of said positions: mechanic vs technician. However, we strongly feel that the mechanic would be better represented and marketed, as a career, if they were to be branded as aircraft engineers. The European equivalent to the FAA is known as EASA and their mechanics are known as engineers. We strongly believe that rebranding aircraft mechanic as an aircraft engineer would attract a younger demographic and garner support of their parents upon entering the aviation maintenance field.

- 3.) Streamline and Assist with the Certification Process and Testing Challenges for Adult Education Programs** – This speaks directly to apprentice students/workers to entice them into the industry. Allow MROs and airlines to take them on as an unlicensed apprentice technicians and conduct their own curriculum/training in-house.
- 4.) Streamline Entry for those with Prior, Directly-Relatable Skills - i.e., the Surplus of Military Aircraft Technicians** – Strip away the extraneous tasks of having a military aircraft technician demonstrate the proper method for performing a scarf splice repair on an aircraft WOOD structure and permit experienced military technicians to cross directly into the workplace which they have a proven track record and verifiable training to back up their credentials.
- 5.) Streamline FAA Regulations as it Pertains to CFR Part 147 Curriculum** – Recently, our industry partners (Delta Air Lines, JetBlue Airways and American Airlines) have expressed their concerns towards the rapid changes in technology with respects to students' preparedness. We must remind everyone here today that the airframe and powerplant certificate was designed solely as a "license to learn", and not a license to troubleshoot modern-day aircraft, we, the staff at Aviation High School, wish to alleviate such concerns.

Much emphasis is being placed on the modernization of curriculum. We are in unison that change is necessary and we feel that the major overhaul required to modernize and revamp the curriculum will translate to a higher learning standard; however, the financial resources needed to make these changes would prove to be too costly to each school. Our proposal involves minimizing the financial strain by implementing changes to the curriculum based on geographical needs. For example, the current curriculum proves to

be beneficial for students in rural America who need to perform maintenance on **crop-duster type** aircraft; however, the same curriculum proves to be obsolete for students in metropolitan areas that need to maintain more modern and advanced aircraft. Furthermore, it will assist schools to better align their coursework with the needs of the industry as it pertains to their geographical location, i.e., general aviation, commercial, cargo, manufacturing or MRO jobs, etc.

As the nation's largest CFR Part 147, we are committed to finding a solution. We believe that we can successfully modify the current curriculum, in collaboration with: the local FSDO, industry partners, and aviation maintenance technician schools. This collaboration will provide students with a structured system of work-based learning projects that are designed to address current industry needs.

Lastly, as an example of the type industry-relatable projects students can work on, we have brought an actual student project that speaks directly to the "aviation work-based learning projects" previously mentioned. This project was designed and created in collaboration with our local FSDO, Delta Air Lines and JetBlue Airways. We can make this project available for subcommittee members to review if time permits today.

Thank you very much for this opportunity to testify today on behalf of Aviation High School and we look forward to your questions.

Steven Robert Jackson started his teaching career at Aviation High School as a social studies teacher at the start of the 2000-2001 school year, served as assistant principal of organization and security from 2009-2016 and has been principal since the 2016-2017 school year. Please visit www.aviationhs.net for more information on the school, Mr. Jackson and the staff.