Testimony before the
United States Senate Committee on
Commerce, Science, and Transportation's
Subcommittee on Aviation Safety, Operations, and Innovation
by

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"Developing the Aviation Workforce of the 21st Century"
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Good morning, Chairwoman Sinema, Ranking Member Cruz, and subcommittee members. Thank you for this opportunity to discuss the U.S. aviation workforce. Embry-Riddle Aeronautical University is the nation's top producer of U.S. commercial airline pilots, with a fleet of training aircraft that makes us the size of a small regional airline.

Embry-Riddle's mission is to prepare students for productive careers and leadership roles in business, government agencies, and the military. Through our commitment to excellence in education, we are preparing a highly qualified future aviation talent pool and building current workforce capacity to support U.S. competitiveness.

I will briefly summarize key challenges and suggest potential solutions and opportunities.

First, I would like to emphasize that the aviation workforce shortage is real and it is a critical problem for the U.S. economy. Between 2021 and 2040, The Boeing Company has projected, that the aviation industry will need 612,000 new pilots and 626,000 new aviation

maintenance technicians.[1] Across North America, specifically, Boeing estimates that we will need 130,000 new pilots and 132,000 technicians by 2040.

This represents a growing problem for American competitiveness because aviation is a major driver of our economy. The U.S. Federal Aviation Administration has reported that all civil aviation activity amounted to more than 5.2 percent of the U.S. Gross Domestic Product, supporting10.9 million jobs.[2]

At Embry-Riddle, graduates of our flight and maintenance degree programs are securing jobs before they receive their diplomas. But, many more graduates are needed to fill jobs. That will require tapping the entire talent pool – meaning men and women from all walks of life, including veterans and members of the military who are transitioning back into civilian life. In March this year, the FAA's Women in Aviation Advisory Board concluded that "attracting, retaining, and advancing women in aviation is critical to the U.S. aviation industry's safety, sustainability, profitability, and ability to innovate."[3]

We agree that cultivating transformative thinking by recruiting a diversity of perspectives is particularly important at this moment, as the aviation industry faces both opportunities and challenges – related not only to the workforce shortage, but also to increasing aviation cybersecurity threats and the exponential growth of commercial space enterprise. We, therefore, applaud United Airlines CEO Scott Kirby, who last year announced that the United Aviate Academy would recruit from the broadest possible spectrum of talent, with half of its student pilots being exceptionally qualified women and people of color.[4]

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[1] "Pilot and Technician Outlook: 2021-2040." The Boeing Company, <www.boeing.com/commercial/market/pilot-technician-outlook/>.

[2] "The Economic Impacts of Civil Aviation in the U.S. Economy: State Supplement." U.S. Department of Transportation, Federal Aviation Administration, November 2020, <www.faa.gov/sites/faa.gov/files/about/plans_reports/2020_nov_economic_impact_report.pdf>.

[3] "Breaking Barriers for Women in Aviation: Flight Plan for the Future." U.S. Federal Aviation Administration, Women in Aviation Advisory Board, March 2022, <www.faa.gov/regulations_policies/rulemaking/committees/documents/media/WIAAB_Recommendations_Report_March_2022.pdf>.

[4] "United Sets New Diversity Goal: 50% of Students at New Pilot Training Academy to be Women and People of Color." United Airlines, April 6, 2021, <www.united.com/en/us/newsroom/announcements/2021-04-06-united-sets-new-diversity-goal-50-of-students-at-new-pilot-training-academy-to-be-women-and-people-of-color-2651374725>.

Such bold steps are critical to ensure a robust aviation workforce for the future. Nationwide, only 2.6% of all aviation maintenance technicians and 4.6% are Airline Transport Pilots in the United States are women.[5]

Although these overall statistics haven't changed much in decades,[6] progress is possible. Many airlines have in fact achieved significantly greater equality on the flight deck than the national averages.[7] And at Embry-Riddle, we see progress every day. Last month, for example, Embry-Riddle sent an all-female team to the worldwide Aerospace Maintenance Competition. A recent panel of highly accomplished aviation graduates were all women, including three who are women of color. We were also proud to have six of our graduates on the Women in Aviation Advisory Board – among a remarkable assemblage of 30 female CEOs, captains, first officers, university presidents, and other leaders.

That level of visibility is key. In order to know that they can "be it," students must "see it" – in the form of role models and mentors, and through confidence-building camps, at the earliest stages of education. Young people also need to be introduced to a full range of aviation careers – from mechanic to airport manager, flight physician, accident investigator, and more. Raising awareness is why initiatives such as Women in Aviation International's Girls in Aviation Day are so essential. It's also why Embry-Riddle offers summer camps and MOOCs, or massively open online courses, to introduce girls to aviation.

Most importantly, financial support for aviation students remains paramount. The FAA's Women in Aviation Advisory Board pointed out in its report that, "Next to culture, cost is the biggest barrier for women wanting to enter aviation careers."[8] To address that need, Embry-Riddle collaborates with industry partners. For example, The Boeing Company established an endowment to provide opportunities to a broader spectrum of aviators, including exceptional veterans, women, and people of color. We are partnering with Spirit Airlines in a similar fashion. Embry-Riddle and its airline partners also offer career pilot pathway programs for outstanding

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[5] Lutte, Rebecca K. "Women in Aviation: A Workforce Report 2021 Edition." Aviation Institute, University of Nebraska at Omaha, in cooperation with Women in Aviation International, December 2021, <www.wai.org/sites/default/files/assets/News/lutte2021womeninaviationworkforcereport_website.pdf>.

[6] *Ibid.*

[7] "How Major Airlines are Measuring Up On Gender Equality in the Flight Deck." International Society of Women Airline Pilots, 2021, <//isa21.org/wp-content/uploads/2022/04/2021-ISA21-Graphs.pdf>.

[8] "Breaking Barriers for Women in Aviation: Flight Plan for the Future." U.S. Federal Aviation Administration, Women in Aviation Advisory Board, March 2022, <www.faa.gov/regulations_policies/rulemaking/committees/documents/media/WIAAB_Recommendations_Report_March_2022.pdf>.

male and female aviation students. Through these pathway programs, exceptional students receive incentives and training while working toward first officer positions.

Finally, Embry-Riddle is speeding the flow of aviators into the workforce by leveraging virtual reality training systems, coupled with in-person training. Our "VR-first" training program allowed a group of 58 flight students to reduce the time it took them to complete a first solo flight by more than 30 percent. VR-first training shows promise as one way to help meet the aviation industry's workforce needs, but rigorous research is needed to validate VR technologies for specific uses; currently, the FAA does not allow pilots to count time in VR flight simulations toward Total Pilot Hours.

In closing, our suggestions for the aviation industry's workforce are three-fold:

1. First, we are optimistic that implementation of the recommendations set forth in the FAA Women in Aviation Advisory Board report will help the industry reach a much broader talent pool, thereby enhancing the aviation workforce.
2. Second, we would note that the European Union Aviation Safety Agency qualified its first virtual reality-based flight training device last year. We hope that further research in the United States will soon validate the effectiveness of high-quality virtual reality-based training technologies, leading to their broader acceptance as an integral part of flight-training programs.
3. Third, we will continue to urge new and more innovative industry-university partnerships to provide aviation students with the financial support, mentorship, and encouragement they need to succeed.

Thank you again for this opportunity. I look forward to answering your questions.