

Statement by
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Before the
United States House of Representatives
Committee on Transportation and Infrastructure
Subcommittee on Aviation
on
Bridging the Gap: Improving Diversity and Inclusion in the U.S. Aviation Workforce
July 20, 2021

Chairman Larsen, Ranking Member Graves, and members of the Subcommittee, thank you for the opportunity to address the Subcommittee to discuss developing a diverse aviation workforce.

My name is Becky Lutte, PhD, CFII, MEI. I am an Associate Professor at the Aviation Institute at the University of Nebraska at Omaha. I also serve on the FAA's Women in Aviation Advisory Board. I am here speaking for myself as an aviation professional with research experience in aviation workforce and diversity. My primary area of research is women in aviation.

It is essential for the future of the aviation industry that we have broad representation within our workforce. A diverse representation of thought results in enhanced safety, innovation, and profitability. In addition, to meet the workforce needs for the future we simply must target a wider talent pool. The Boeing forecast¹ predicts a need for 763,000 new civilian pilots, 739,000 new maintenance technicians, and 903,000 new cabin crew members worldwide over the next 20 years. Workforce demand remains a concern today, even given the impact of the pandemic on the industry. As noted by CAE, the fundamental factors impacting pilot demand prior to the pandemic have not changed. Those factors include an aging workforce and anticipated growth including an additional 11,000 corporate and business aircraft worldwide in the next 10 years² and over 43,000 new commercial aircraft worldwide over the next 20 years³. The goal remains the same, to recruit and retain the highest level of talent for the future of the industry.

Data on underrepresented groups in aviation

Many groups remain significantly underrepresented in aviation. Overall women make up less than 20% of the workforce in most aviation occupations (see Table 1). The largest gender gaps continue to be in the areas of senior leadership positions, professional pilots, and maintenance technicians. Only approximately 5% of airline pilots are women. Women in

¹ Boeing Pilot and Technician Outlook 2020 – 2039. <https://www.boeing.com/commercial/market/pilot-technician-outlook/>

² CAE Pilot Demand Outlook 2020. <https://www.cae.com/cae-pilot-demand-outlook-2020/>

³ Boeing Commercial Market Outlook 2020 – 2039. <https://www.boeing.com/commercial/market/commercial-market-outlook/>

maintenance represent one of the greatest gender gaps in the entire industry at 2.5%. By comparison, women represent 26% of people working in STEM fields globally.⁴

Table 1: Women in the Aviation Workforce⁵

	Aviation Occupation	% Women
< 10%	Maintenance technicians	2.5%
	Airline executives (CEO, COO)	3.0%
	Air Transport Pilots	4.6%
	Total Pilots	7.9%
10% - 20%	Aerospace engineers	11.6%
	Aviation higher education faculty	15.6%
	Airport managers	16.7%
	Air traffic controllers	16.8%
	Aerospace and defense CEOs (US)	19%
	Dispatchers	19.4%
21% >	Flight attendants	79.2%
	Travel agents	79.5%

It is especially important to note that in many occupation areas, the number of women in aviation has changed very little over the years. As Figure 1 shows, many classifications of women in aviation have changed by only about a percentage point or less in the last 15 years. As the table shows, the percentage of women student pilots for 2019 was 13.8%. By comparison, the percentage of women private pilots was 6.63% with an increase over the last 15 years of only .28%. The concern is the lack of converting women student pilots to private pilots and the implications for the future pipeline. An additional indication of women in the aviation workforce is provided in Figure 2. Again, you can see relatively little change in the percentage of women employed in aviation related government organizations.

⁴ Korn Ferry. (2020). IAWA Soaring through the glass ceiling. <https://www.kornferry.com/content/dam/kornferry/docs/pdfs/aviation-glass-ceiling.pdf>

⁵ Lutte, R. Women in Aviation Workforce Report 2021 edition (anticipated publication Fall 2021).

Figure 1: Women in Aviation Workforce Timeline⁶

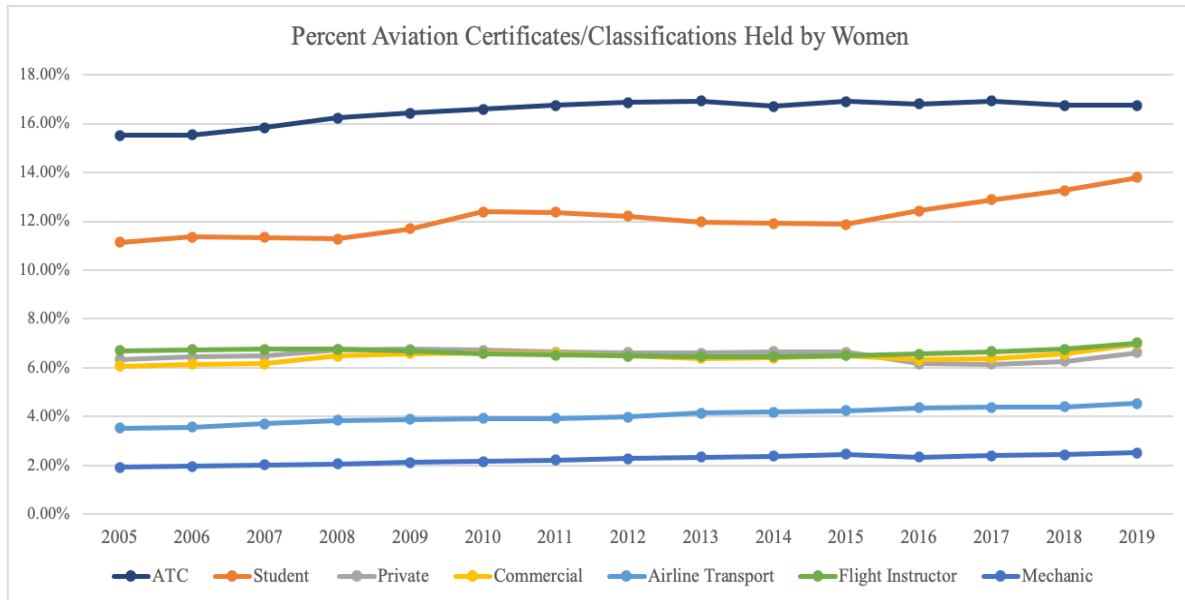
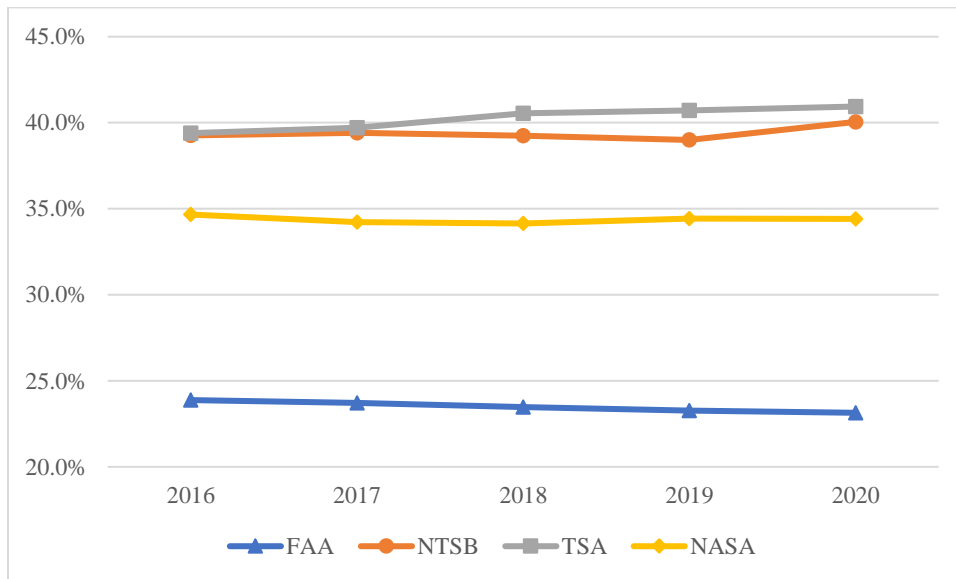


Figure 2: Women in Aviation Government Workforce⁷



Further, the workforce in many aviation occupations lacks ethnic and racial diversity. Table 2 provides additional data on underrepresented groups in aviation. This data is developed from the Bureau of Labor Statistics (BLS) Current Population Survey (CPS) data but is only

⁶ Lutte, R. Women in Aviation Workforce Report 2021 edition (anticipated publication Fall 2021).

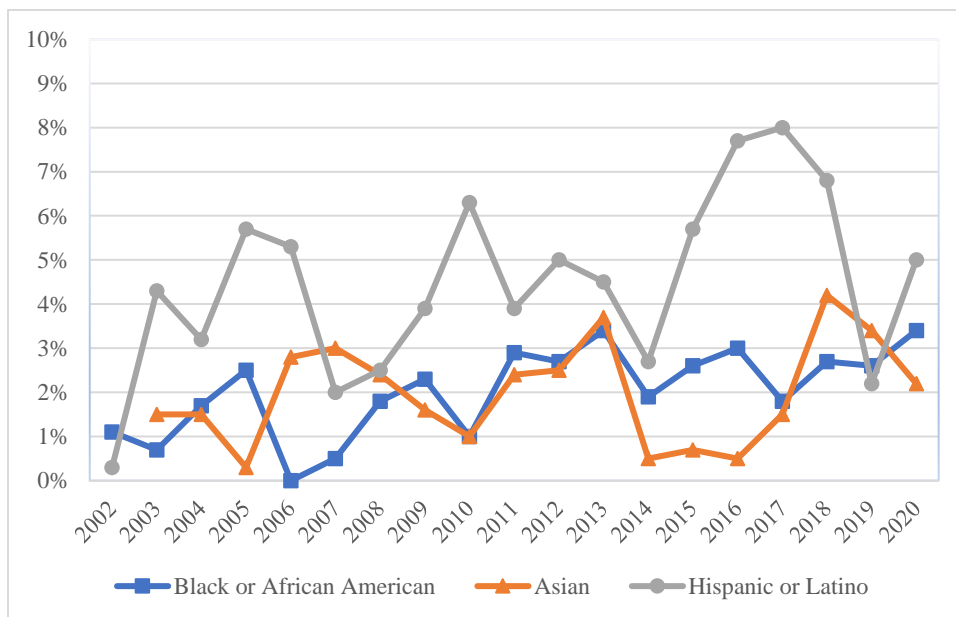
⁷ Lutte, R. Women in Aviation Workforce Report 2021 edition (anticipated publication Fall 2021).

available for a limited number of occupational areas in aviation. Figure 3 also provides an example of timeline data broken down by race and ethnicity for the occupational area of pilots and flight engineers as noted in the BLS CPS. You can see greater variation in this graph, but it still shows consistent underrepresentation with relatively small overall changes. A more accurate indicator could be gained if FAA airman certification data were also listed by race and ethnicity.

Table 2: Aviation Workforce: Underrepresented groups

Occupation	Total Employed	% White	% Black or African American	% Asian	% Hispanic or Latino
Pilots	155,000	94%	3.4%	2.2%	5%
Maintenance Technicians	153,000	84.3%	10.8%	3.2%	23%
Aerospace Engineers	129,000	83.3%	6.8%	9.1%	10.5%
Flight Attendants	81,000	65%	19.3%	10.6%	10.3%

Figure 3: Aircraft Pilots and Flight Engineers Workforce Timeline



This brings me to my first recommendation. We simply don't have great data on the number of women and underrepresented groups within aviation. What gets measured gets done. Establishing a comprehensive system of tracking data and reporting on trends is the only way to verify that diversity investments and efforts are working. While the FAA publishes airman

certification data, which is a great source of information, the data is currently provided for gender but cannot be broken down by race or ethnicity. We need a good indication of not only women in aviation but women who also belong to additional underrepresented groups. As an example, we don't have good data on black women pilots or maintenance technicians from the FAA certification database. However, Sisters of the Skies reports that the number of professional black women pilots are less than ½ of 1% of total professional pilots.⁸

Industry should publish data on their workforce broken down by gender, race and ethnicity, and occupation level so that we better understand the number of members of underrepresented groups employed and in leadership positions. One best practice example of this is Boeing's recent move to publicly display on their website their workforce data along with a message from leadership acknowledging the efforts to do more.⁹ As stated in a recent Harvard Business Review article, if a company doesn't track representation, the company isn't serious about gender equity.¹⁰

Women in aviation: Barriers to recruitment and retention and recommendations to address them

To increase the number of women in aviation we need to address barriers. Research has shown that the barriers include:

- need for additional outreach
- lack of women in leadership positions
- need for leadership commitment to diversity and inclusion
- cost of entry, particularly for flight training
- family and work balance
- navigating the workplace culture including gender bias and sexual harassment

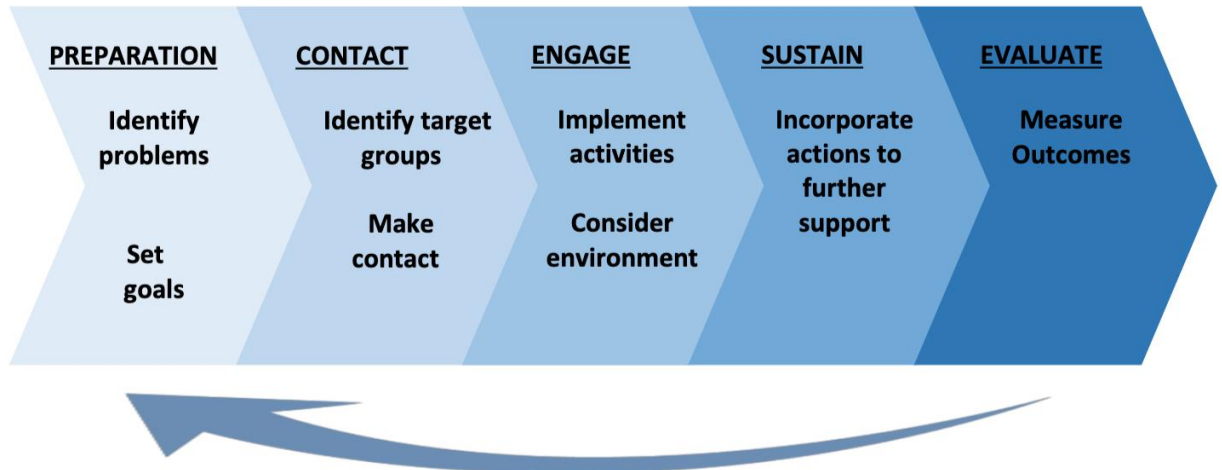
As an industry we need to continue efforts for youth outreach to recruit the next generation of aviation professionals. Key elements for successful outreach programs include preparation and preplanning, identifying target groups and initiating contact, implementing the activity, providing next steps to sustain the momentum, and conducting an evaluation. These steps are depicted in Figure 4. Particularly for underrepresented groups, outreach should also include a “see it, be it” element. It is essential that youth outreach include broad representation of aviation professionals so that the next generation will see people that they identify with who are in aviation occupations.

⁸ Sisters of the Skies. <https://www.sistersoftheskies.org/>

⁹ Boeing 2021 Global Equity, Diversity, & Inclusion Report. <https://www.boeing.com/principles/diversity-and-inclusion/annual-report/>

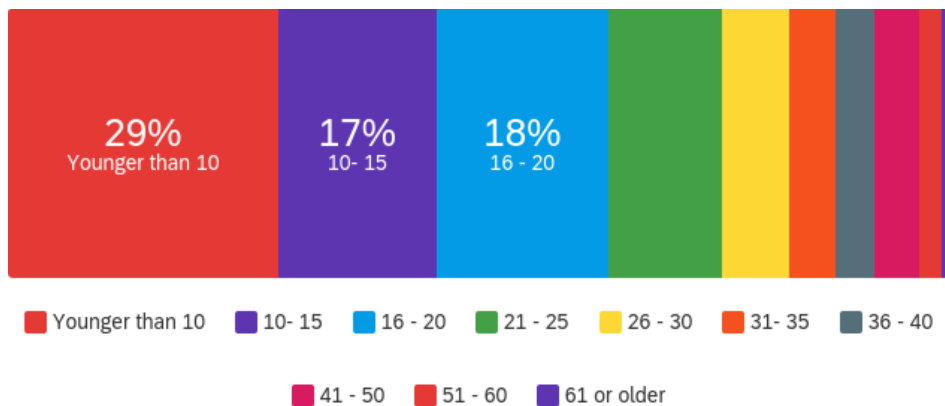
¹⁰ Kersey, A. Women at Work. Harvard Business Review. https://m.a.email.hbr.org/rest/head/mirrorPage/@Cc_7lkxsfMcl-wgTzP5zqwKkVfnCNi4tZO6ipfi_p2PgTN8NTWQkfvVlznSG8yupg520tJsp3ymhp3FrwUmqPG7UrMiQgtsQAW20D-x_gVL_11Yu.html?deliveryName=DM138446

Figure 4: Model of Aviation Outreach ¹¹



Another key element is targeting the right age group. A survey by the Experimental Aircraft Association (EAA), revealed that women in aviation were first introduced to aviation most often at the age group of younger than 10 (Figure 5). A total of 64% were introduced to aviation at the age of 20 or younger. Clearly youth outreach at an early age is essential. Some excellent examples of youth outreach include the EAA Young Eagles program and the AOPA aviation high school STEM curriculum. Standout examples of youth outreach targeting underrepresented groups include Women in Aviation Girls in Aviation Day and the many youth programs at the Organization of Black Aerospace Professionals (OBAP) including their latest Girls Launch program.

Figure 5: Survey of women in aviation: Age first became interested in aviation¹²



¹¹ Lutte, R. (2018). Aviation outreach model and gap analysis: Examining solutions to address workforce shortages. Collegiate Aviation Review International. <https://ojs.library.okstate.edu/osu/index.php/CARI/article/view/7428>

¹² EAA. Women Soar Survey.

In the International Aviation Women's Association (IAWA) Soaring Through the Glass Ceiling study, the two most important enablers for the advancement of women in aviation were identified as having more women role models in leadership and ensuring a strong and visible commitment to diversity and inclusion from leadership.¹³ To address the lack of women in leadership positions the industry needs additional formal mentorship and sponsorship programs. This will provide an opportunity to identify top talent to promote more members of underrepresented groups into leadership positions.

Cost of entry to the profession has been shown to be an additional barrier. As an example, for someone pursuing a professional flight degree at a university program, the flight training costs can increase the total cost to the student by anywhere from \$50,000 to \$80,000 depending on the program. Recommendations to address this challenge include increasing access to financial aid for students so that it not only covers the current costs of tuition and fees but also covers the additional costs associated with aviation specific training such as flight or maintenance training. Scholarships assist in addressing the cost barrier. Organizations such as Women in Aviation International (WAI) and OBAP provide essential scholarship opportunities. This year WAI will award over \$450,000 in scholarships and the organization has provided a total of over \$14.5 million in scholarships.

A clear challenge for women in aviation has been family and work balance. In a survey of women in aviation, 38% of the women surveyed indicated that they had considered leaving the aviation industry.¹⁴ The top reason given for considering leaving was poor family and work balance, followed by negative culture. The industry needs family friendly policies, such as paid parental leave, to address these challenges.

The last barrier to discuss is perhaps the hardest to tackle. The evidence is clear that negative workplace culture, to include gender bias and sexual harassment, is a deterrent to the ability to recruit and retain women in aviation. This is supported by multiple studies. For example, in an open-ended survey question of women in aviation, when women were asked about the greatest challenge/barrier experienced in their careers, the most often given response was related to a negative workplace culture.¹⁵ In the IAWA Soaring Through the Glass Ceiling study, 40% of women surveyed felt their voices were not heard and 2/3 felt like they were treated differently because of their gender.¹⁶ This is also consistent with the broader field of tech. According to a study by Accenture on women in tech, poor company culture was the number one cause for women leaving their jobs.¹⁷ In order to change culture, we need to change the system. That includes looking at artifacts of culture such as language, uniforms, and representation (images) in materials. A recommended guide to changing language in aviation has been provided

¹³ Korn Ferry. (2020). IAWA Soaring through the glass ceiling. <https://www.kornferry.com/content/dam/kornferry/docs/pdfs/aviation-glass-ceiling.pdf>

¹⁴ Lutte, R. Women in Aviation Survey results. https://www.researchgate.net/publication/342397027_WAI_Conference_2020_Lutte_Presentation_of_Women_in_Aviation_Survey_Results

¹⁵ Lutte, R. Women in Aviation Survey results. https://www.researchgate.net/publication/342397027_WAI_Conference_2020_Lutte_Presentation_of_Women_in_Aviation_Survey_Results

¹⁶ Korn Ferry. (2020). IAWA Soaring through the glass ceiling. <https://www.kornferry.com/content/dam/kornferry/docs/pdfs/aviation-glass-ceiling.pdf>

¹⁷ Accenture. (2020) Resetting tech culture: 5 strategies to keep women in tech. https://www.accenture.com/_acnmedia/PDF-134/Accenture-A4-GWC-Report-Final1.pdf#zoom=50

in the FAA Drone Advisory Committee ebook (June 23, 2021).¹⁸ In addition to the artifacts of culture, to change the environment we need more members of underrepresented groups in decision making and leadership positions. And lastly, there needs to be more effective education and awareness of the existence of bias and harassment and methods to address it. Changing culture also requires clear and visible commitment from leadership within the industry that all will be respected, and anything less will not be tolerated.

I've talked about the significant gap of underrepresented groups in aviation, some of the barriers, and some suggested recommendations. Let me end on an encouraging note. In my over 30 years in aviation, I have never seen so much momentum behind efforts to broaden representation in our industry. We have seen strong initiatives from industry like the United Aviate Academy program. We have best practices for aviation outreach to underrepresented groups such as Women in Aviation Girls in Aviation Day, and the many youth programs at the Organization of Black Aerospace Professionals. Perhaps one of the best indicators is the FAA Women in Aviation Advisory Board. The final report of this board is targeted for release in the first quarter of 2022. It represents many hours of work by industry leaders to identify bold recommendations to meet the goal of creating broader representation for the future success of aviation. I encourage you to carefully review the report when completed. I'll leave you with the following thought, every system is perfectly designed to give us the results that we get. If we want increased representation in our aviation workforce, it's time to change the system. Thank you for your time.

¹⁸ FAA Drone Advisory Committee Public eBook. June 23, 2021.

https://www.faa.gov/uas/programs_partnerships/drone_advisory_committee/media/DAC_Public_eBook_06_23_2021.pdf