FAA REAUTHORIZATION: EXAMINING THE CURRENT AND FUTURE CHALLENGES FACING THE AEROSPACE WORKFORCE

(118–13)

HEARING

BEFORE THE

SUBCOMMITTEE ON
AVIATION

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED EIGHTEENTH CONGRESS

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Washington, DC 20515

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APRIL 14, 2023

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Aviation
FROM: Staff, Subcommittee on Aviation
RE: Subcommittee Hearing on "*FAA Reauthorization: Examining the Current and Future Challenges Facing the Aerospace Workforce*"

I. PURPOSE

The Subcommittee on Aviation will meet on Wednesday, April 19, 2023, at 10:00 a.m. ET in 2167 Rayburn House Office Building for a hearing titled, "*FAA Reauthorization: Examining the Current and Future Challenges Facing the Aerospace Workforce*." The hearing will examine the current state of the United States' aerospace workforce, challenges facing future industry needs, implementation of the workforce-related provisions in the 2018 Federal Aviation Administration (FAA) reauthorization law, and proposed solutions designed to address ongoing challenges in advance of Congress reauthorizing the FAA's statutory authorities which expire on October 1, 2023. The Subcommittee will receive testimony from the Regional Airline Association (RAA); Vaughn College of Aeronautics and Technology; FlightSafety International (FSI); the Government and Accountability Office (GAO); and the Air Line Pilots Association, International.

II. BACKGROUND

Civil air transportation significantly contributes to domestic and international economies. A recent FAA report notes that in 2019, civil aviation contributed 4.9 percent of the United States gross domestic product (GDP), generated $1.9 trillion in total economic activity, and supported nearly 10.4 million United States jobs.[1] Although the COVID–19 pandemic effectively reduced these values by an estimated 50 percent in 2020, air transportation traffic in North America continues to grow and is expected to exceed pre-pandemic levels this year, ahead of some other markets.[2]

[1] FAA, THE ECONOMIC IMPACT OF U.S. CIVIL AVIATION: 2020 (Aug. 2022) *available at* https://www.faa.gov/sites/faa.gov/files/2022-08/2022-APL-038%202022__economic%20impact__report.pdf.

[2] *See id*.; Press Release, INTERNAT'L AIR TRANSP. ASSOC'N, *Air Travel Growth Continues in February*, (Apr. 4, 2023) *available at* https://www.iata.org/en/pressroom/2023-releases/2023-04-04-02/; News Release, *ICAO forecasts complete and sustainable recovery and growth of air passenger demand in 2023*, (Feb. 8, 2023), *available at* https://www.icao.int/Newsroom/Pages/ICAO-forecasts-complete-and-sustainable-recovery-and-growth-of-air-passenger-demand-in-2023.aspx.

According to the FAA, United States air carrier domestic passenger growth is forecasted to average 4.7 percent per year over the next 20 years.[3] This average projected growth includes double digit growth in 2022 and 2023, prompting some aviation stakeholders to raise concerns about whether there will be sufficient workers to meet both present-day and future demand. A recent industry report concluded that "tight labor market conditions go beyond having enough crews for flights; it also reflects staffing problems in the ranks of ground staff, baggage handlers, air traffic controllers, Transportation Security Administration agents, and vendors that help supply airlines and airports."[4] Additionally, the same report noted there were not enough people to repair aircraft and highlighted that executives in the aircraft maintenance and repair industry identified finding new hires as their biggest challenge.[5]

The rate of attrition and retirements across the aerospace workforce also present challenges, the latter of which particularly exacerbated by the pandemic. For instance, the Youth Access to American Jobs in Aviation Task Force (YIATF) highlighted in its September 2022 report that the aviation industry, "an industry with 50,000 unfilled positions[,] is losing staff at a rate six percent higher than other sectors and at the same time is losing out in recruiting new talent due to factors including a failure to compete with tech companies' pay rates."[6] Although the air transportation sector faced an unparalleled need for talent, especially for pilots, before the COVID–19 pandemic, the workforce challenges facing the industry today are more acute across the board than ever before.[7] Congress must examine challenges facing the aerospace workforce and explore opportunities to address those challenges to ensure the aerospace workforce is capable of meeting demand for decades to come.

III. KEY AEROSPACE OCCUPATION PROFILES AND ISSUES FOR CONSIDERATION

The civil aviation sector relies on a highly skilled and largely certified workforce that includes pilots, maintenance and repair technicians, aircraft and component manufacturers, engineers, aircraft schedulers and dispatchers, and air traffic controllers. Though the breadth of aviation professionals goes beyond those professions listed, this hearing will focus on airline pilots and aircraft mechanics, as these professions are heavily regulated, require significant training and experience to achieve FAA certification, and are essential to the safe operation of the National Airspace System (NAS).

AIRLINE PILOT WORKFORCE

The career path to becoming a United States airline pilot requires an individual to not only satisfy FAA training and instruction requirements, but also obtain qualifying flight experience. Present-day demand is strong, as is evidenced by hiring rates.[8] Both mainline and regional pilot pay has increased in recent years; in 2021, the median wage for airline and commercial pilots was $134,630.[9] Moreover, the Bureau of Labor Statistics (BLS) projects the overall employment of airline and commercial pilots to grow six percent from 2021 to 2031.[10]

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[3] FAA, FAA AEROSPACE FORECAST FISCAL YEARS 2022–2042 at 2 (June 28, 2022), *available at* https://www.faa.gov/sites/faa.gov/files/2022-06/FY2022__42__FAA__Aerospace__Forecast.pdf.

[4] *As leisure travel recovers to 2019 levels, airlines struggle to match the rebound's intensity, according to Oliver Wyman*, OLIVER WYMAN, (June 7, 2022), *available at* https://www.oliverwyman.com/media-center/2022/jun/as-leisure-travel-recovers-airlines-struggle-to-match-rebounds-intensity.html?bsrc=oliverwyman.

[5] *Id.*

[6] FAA, YOUTH ACCESS TO AMERICAN JOBS IN AVIATION TASK FORCE, FINAL REPORT, (Sept. 22, 2022) [hereinafter *YIATF Report*], *available at* https://www.faa.gov/regulations__policies/rulemaking/committees/documents/media/YIATF__Taskforce__Report%209-22-22%20FINAL.pdf.

[7] U.S. GOV'T ACCOUNTABILITY OFF., GAO–14–232, AVIATION WORKFORCE: CURRENT AND FUTURE AVAILABILITY OF AIRLINE PILOTS, (2014), *available at* https://www.gao.gov/products/gao-14-232; *YIATF Report, supra* note 6.

[8] David Koenig, *A nationwide pilot shortage is straining air travel*, LOS ANGELES TIMES (Feb. 10, 2023), *available at* https://www.latimes.com/business/story/2023-02-10/a-nationwide-pilot-shortage-is-straining-air-travel.

[9] U.S. BUREAU OF LABOR STAT., DEPARTMENT OF LABOR, OCCUPATIONAL OUTLOOK HANDBOOK, *Airline and Commercial Pilots, available at* https://www.bls.gov/ooh/Transportation-and-Material-Moving/Airline-and-commercial-pilots.htm.

[10] *Id.*

Pilot Training and Costs

Individuals training to become a pilot can undertake their pilot education and training at a collegiate aviation school, a non-collegiate vocational pilot school, or a non-collegiate, instructor-based pilot school.[11] In addition, the military trains and certificates pilots, many of whom pursue careers as airline pilots upon exiting the military.[12] However, former military pilots make up fewer new hires at airlines today than they once did, especially as the military is currently facing its own challenges recruiting pilots.[13] Though the costs of training vary greatly based on the training pathway chosen and the time it takes to complete training, one of the largest vocational flight schools estimates that it costs $96,995 to become a pilot if an individual has no previous flight experience.[14] On the collegiate front, a 2018 GAO report cited that tuition costs for a professional pilot student can often exceed $100,000.[15]

Upon completion of training and passage of the requisite FAA tests, an individual can obtain a pilot certificate.[16] To obtain a commercial pilot certificate—which is required for an individual to fly aircraft for compensation for non-airline pilot jobs—they typically must have flown a minimum of 250 total flight hours.[17] To be eligible for hire as either a pilot-in-command (captain) or second-in-command (first officer) for a United States scheduled airline, an individual must also obtain an airline transport pilot (ATP) certificate, the highest level of pilot certification, in addition to their other certificates and ratings.[18] An ATP certificate requires an individual to have obtained at least 1,500 flight hours. Current regulations allow for but restrict the number of these flight hours that can be accrued in a full flight simulator or through the usage of a flight training device to not more than 100 hours if the aeronautical experience was accomplished as part of an approved training course.[19] Some pilots with fewer than 1,500 flight hours can obtain a "restricted-privileges" ATP certificate (R–ATP), under which specific academic training courses and military experience can count toward the flight hour requirement.[20] If a pilot holds an R–ATP certificate, they may be hired as a first officer by a Part 121 airline; however, they cannot be a captain until they obtain an ATP certificate after accumulating 1,500 hours total flight hours.[21]

The standards for obtaining pilot certificates in the United States have changed little since implementation of the bipartisan Airline Safety and Federal Aviation Administration Extension Act of 2010 (P.L. 111–216), which mandated a minimum of 1,500-flight hours to obtain an ATP certificate and directed the FAA to amend regulations to require all first officers to have an ATP certificate.[22] The FAA subsequently adopted the 1,500-flight hour requirement in 2013.[23] These changes and many others followed the Colgan Air flight 3407 crash near Buffalo Niagara International Airport, NY, in 2009, which killed 50 people.

The standards for obtaining a certificate to conduct commercial, passenger carrying operations in the United States differ vastly from the professional pilot certification pathways adopted internationally. For instance, the International Civil Aviation Organization's (ICAO) multi-crew pilot (MPL) certificate, adopted in 2006, enables pilots to become a first officer in approximately 18 months, with a minimum of 240 hours of total actual and simulated flight hours. ICAO does not specify the breakdown between actual and simulated flight hours and thus allows part of the training curriculum to be accounted for on flight simulators; however, MPL-holders

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[11] U.S. GOV'T ACCOUNTABILITY OFF., GAO–18–403, COLLEGIATE AVIATION SCHOOLS: STAKEHOLDER'S VIEWS ON CHALLENGES FOR INITIAL PILOT TRAINING PROGRAMS, (2018), *available at* https://www.gao.gov/assets/gao-18-403.pdf.

[12] See *supra* note 8.

[13] U.S. GOV'T ACCOUNTABILITY OFF., GAO–14–232, AVIATION WORKFORCE: CURRENT AND FUTURE AVAILABILITY OF AIRLINE PILOTS, (2014), *available at* https://www.gao.gov/products/gao-14-232; Rachel Cohen, *Perennial pilot paucity puts Air Force in precarious position*, AIR FORCE TIMES (Mar. 3, 2023), *available at* https://www.airforcetimes.com/news/your-air-force/2023/03/03/perennial-pilot-shortage-puts-air-force-in-precarious-position/.

[14] ATP, *How Much Does it Cost to Become a Pilot?*, (accessed Apr. 3, 2023), *available at* https://atpflightschool.com/become-a-pilot/flight-training/pilot-training-cost.html.

[15] U.S. GOV'T ACCOUNTABILITY OFF., GAO–18–403, *supra* note 11.

[16] *Id.*

[17] 14 C.F.R. § 61.129 (2023).

[18] 14 C.F.R. § 121.436 (2023).

[19] 14 C.F.R. § 61.159 (2023).

[20] U.S. GOV'T ACCOUNTABILITY OFF., GAO–18–403, *supra* note 11.

[21] See *supra* note 13.

[22] Pub. Law No. 111–216, 124 Stat. 2348.

[23] 78 Fed. Reg. 42324 (July 15, 2013).

must also meet all the actual flying time for a private pilot license, plus additional actual flying time in instrument, night flying, and upset recovery.[24]

Regarding pilot training and competency requirements, some aviation stakeholders argue that certain requirements result in pilots accruing flight hours that are not directly relevant to a complex, multi-crew airline environment or may create barriers to entry into this career.[25] Other stakeholders, notably pilot unions, contend that the present-day first officer qualifications are appropriate and that United States air carriers should alternatively do more to recruit and retain pilots.[26] A recent position paper summarized that the "commercial aviation industry is at a crossroads, and the practices it adopts now relative to how the pilots of the future are selected, trained and mentored will have critical safety ramifications during a period of projected rapid global growth." [27]

Pilot Supply and Outlook

The number of individuals qualified to become airline pilots has increased from 2017 through 2022 by about 3,000, from 144,557 to 147,934 certificates.[28] The number of new ATP certificates issued each year over the 2017 to 2022 time period increased by more than 100 percent, from 4,449 to 9,588.[29] Despite the uptick in supply of qualified individuals, there is growing concern about whether the growth will be substantial enough to cover both an anticipated increase in industry demand and the wave of pending retirements the industry will face over the next decade.[30] In 2021, one industry analyst noted in a 2021 article that FAA data reflected a third of all active ATP-rated pilots will be forced to retire over the next 10 years.[31] A more recent industry forecast anticipates a shortfall of 17,000 pilots in 2032.[32]

Industry Initiatives

To improve the long-term supply outlook for airline pilots, several major airline carriers have recently launched flight training programs and career pathways to boost pilot supply and supplement hiring initiatives. For example, United Airlines launched its own flight training school in January 2022, the Aviate Academy, becoming the first major United States carrier to own a flight school.[33] Through the Aviate Academy, United Airlines aims to train 5,000 new pilots by 2030.[34] Other airline industry initiatives include American Airlines' Cadet Academy and Delta's Propel Program—which strive to bolster the pool of qualified airline pilots.

AVIATION MAINTENANCE WORKFORCE

The aviation maintenance technician (AMT) workforce generally falls into two categories: (1) certificated mechanics and service technicians (repairmen) and (2) avionics technicians.[35] Aviation maintenance workers are generally employed by commercial airlines, repair stations, and aircraft manufacturers. According to BLS data, the median annual wage in May 2021 was $65,380 for aircraft mechanics and serv-

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[24] ICAO, *Personnel Licensing FAQ*, *available at* https://www.icao.int/safety/airnavigation/pages/peltrgfaq.aspx#anchor24.

[25] U.S. GOV'T ACCOUNTABILITY OFF., GAO–18–403, *supra* note 11.

[26] *Strengthening the Aviation Workforce: Hearing Before the S. Comm. on Commerce, Science and Transportation*, 118th Congress (March 2023) (statement of Capt. Jason Ambrosi, President, Air Line Pilots Association, Int'l).

[27] FLIGHT SAFETY FOUNDATION, POSITION PAPER: PILOT TRAINING AND COMPETENCY, (Mar.2018), *available at* https://flightsafety.org/wp-content/uploads/2018/03/FSF-position-paper-pilot-training-and-competency-FINAL-03-01-18.pdf.

[28] FAA, *U.S. Civil Airmen Statistics* (last updated Jan. 19, 2023) *available at* https://www.faa.gov/data__research/aviation__data__statistics/civil__airmen__statistics.

[29] *Id.*

[30] Geoff Murray & Rory Heilakka, *The airline pilot shortage will get worse*, OLIVER WYMAN, *available at* https://www.oliverwyman.com/our-expertise/insights/2022/jul/airline-pilot-shortage-will-get-worse.html.

[31] Courtney Miller, *A very real pilot shortage threatens to upend the U.S. airline recovery*, THE AIR CURRENT, (Oct. 28, 2021), *available at* https://theaircurrent.com/analysis/real-pilot-shortage-threatens-us-airline-recovery/.

[32] Geoff Murray, Rory Heilakka, Daniel Rye, and Lindsay Grant, *Industry efforts are easing pilot shortage severity*, OLIVER WYMAN, *available at* https://www.oliverwyman.com/our-expertise/insights/2023/jan/industry-efforts-easing-pilot-shortage-severity.html.

[33] Jessica Poitevien, *United Airlines Becomes the First Major U.S. Carrier to Open Its Own Flight School*, TRAVEL + LEISURE, (Oct. 16, 2022), *available at* https://www.travelandleisure.com/airlines-airports/united-airlines/united-airlines-opens-flight-school-aviate-academy.

[34] *Id.*

[35] U.S. GOV'T ACCOUNTABILITY OFF., GAO–20–206, AVIATION MAINTENANCE: ADDITIONAL COORDINATION AND DATA COULD ADVANCE FAA EFFORTS TO PROMOTE A ROBUST, DIVERSE WORKFORCE, (2020), *available at* https://www.gao.gov/assets/gao-20-206.pdf.

ice technicians and $69,280 for avionics technicians.[36] The overall employment of aircraft and avionics equipment mechanics and technicians, according to BLS, is projected to grow six percent from 2021 to 2031.[37]

Training and Costs

In general, it can take between one and three years of education or training to become a FAA-certificated mechanic and earn an airframe rating, a powerplant rating, or an airframe and powerplant (A&P) rating.[38] There are generally three ways to become eligible to take the AMT knowledge test to become a FAA-certificated mechanic: (1) military training and experience; (2) AMT schools; and (3) practical work experience under the supervision of a certificated mechanic.[39] Practical, on the job training is the most inexpensive method for gaining the required experience to become a certificated mechanic, according to the FAA.[40] Tuition at an AMT school, an educational facility certificated by the FAA in accordance with Part 147 of the Federal Aviation Regulations, can vary based on a program, but the average cost for an A&P program in 2022 was $17,754.[41]

FAA-certificated repairmen service aircraft components and must be recommended for certification by their existing employer to perform specific tasks, like welding or painting.[42] It can take a repairman more than a year to obtain the required experience or training to become certificated. Unlike certificated mechanics, a repairman's certificate is only valid at the employer for which it was issued.[43] Additionally, only FAA-certificated mechanics can approve an aircraft for return to service. Mechanics and repairman who are not certificated may still perform repair work, but they must be supervised by an FAA-certificated mechanic or repairman.[44]

Avionics technicians generally install, inspect, test, or repair avionics equipment, such as radar, radio, navigation, and missile control systems in aircraft and space vehicles.[45] There is no required test to become an avionics technician, but the technician may hold an A&P, repairman, or related FAA certificate.[46] Furthermore, employers may have additional qualification requirements for individuals that work on avionics.[47]

Technician Supply and Outlook

According to FAA data, the number of newly-issued mechanic certificates increased 11 percent from 2017–2022, from 6,398 to 7,119 certificates respectively.[48] Despite the increase in newly issued certificates, the total number of certificated mechanics has remained relatively flat over the past two decades.[49] It is projected that by 2031, two out of every five current mechanics—more than 90,000 certificated mechanics in total—will reach retirement age.[50] Using historical output data, the Aviation Technician Education Council (ATEC) estimates that 79,000 mechanics will enter the industry in the next 10 years, approximately 11,000 workers short of replacing the expected retirements over the period.[51] Furthermore, a recent ATEC report found that civil aviation maintenance sector only captures an estimated 10 percent of military members with aviation experience as they transition to civilian life.[52] Should forecasted demand over the same period materialize, as driven by in-

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[36] BLS, DEPARTMENT OF LABOR, OCCUPATIONAL OUTLOOK HANDBOOK, *Aircraft and Avionics Equipment Mechanics and Technicians, available at* https://www.bls.gov/ooh/installation-maintenance-and-repair/aircraft-and-avionics-equipment-mechanics-and-technicians.htm.

[37] *Id.*

[38] U.S. GOV'T ACCOUNTABILITY OFF., GAO–20–206, *supra* note 35.

[39] *Id.*

[40] FAA. *Experience Requirements to Become an Aircraft Mechanic*, (December 2022), *available at* https://www.faa.gov/mechanics/become/experience.

[41] AVIATION TECHNICIAN EDUCATION COUNCIL, 2022 PIPELINE REPORT & AVIATION MAINTENANCE TECHNICIAN SCHOOL DIRECTORY, (Nov. 2022), https://www.atec-amt.org/uploads/1/0/7/5/10756256/atec-pipelinereport-2022.pdf [hereinafter *2022 Pipeline Report*].

[42] U.S. GOV'T ACCOUNTABILITY OFF., GAO–20–206, *supra* note 35.

[43] *Id.*

[44] FAA, *Become a Mechanic Frequently Asked Questions*, (July 2022), *available at* https://www.faa.gov/mechanics/become/faq.

[45] GAO–20–206, *supra* note 35.

[46] *Id.*

[47] *Id.*

[48] FAA, *U.S. Civil Airmen Statistics, supra* note 28.

[49] *2022 Pipeline Report, supra* note 41.

[50] *Id.*

[51] *Id.*

[52] Aircraft Mechanics Fraternal Association, *2023 FAA Reauthorization Priorities* (Aug. 2022), (letter on file, House Comm. on Transp. and Infrastructure, Subcomm. on Aviation).

dustry growth, the mechanic population is expected to fall short nearly 30,000 mechanics to meet commercial aviation needs.[53]

Industry Initiatives

Industry stakeholders and airline operators have established pathway programs to better recruit and retain mechanics in the aviation industry. For instance, the JetBlue Gateways program offers opportunities to current crewmembers interested in pursuing a career as a mechanic.[54] In August 2021, AAR, a Chicago-based aviation maintenance and repair company, partnered with the Corporation for Skilled Workforce to create a program at schools located near its repair stations to demonstrate how students can learn skills leading to multiple career paths at the company.[55] To hire 2,000 mechanics over the next decade, Delta is providing $350,000 in grants to nine aviation high schools around the country to help expand its workforce.[56] Other career development initiatives include apprenticeship programs. A recent industry survey found that apprenticeship programs are the most effective way to attract and retain talent, with 60 percent of respondents rating apprenticeship programs as very effective or extremely effective.[57]

IV. CONGRESSIONAL MANDATES AND INITIATIVES

Aviation Workforce Development Grants

Section 625 of the FAA Reauthorization Act of 2018 (FAARA18; P.L. 115–254) authorized $5 million for a pilot workforce development program and $5 million for an aviation maintenance technician workforce development program.[58] This workforce development program has enjoyed broad support from many aviation stakeholders, as it encourages collaboration between government, industry, and local entities to address skills gaps and encourage more Americans to pursue good-paying careers in aviation. Several stakeholders have touted the success of the program but are concerned that it is oversubscribed. The FAA received more than 300 grant applications in the initial funding round for the two programs but was only able to award 31 total grants.[59] Many aviation stakeholders have expressed interest in continuing and potentially expanding this program in the upcoming FAA reauthorization bill.

Youth Access to American Jobs in Aviation Task Force and the Women in Aviation Advisory Board

There were several other provisions in the FAARA18 targeted toward recruiting and retaining more young people and women to pursue careers in the aviation industry. Section 602 of the law directed the FAA to establish the Youth Access to American Jobs in Aviation Task Force. The task force was required to provide recommendations and strategies to the FAA to facilitate and encourage high school students to enroll in high school career and technical courses.[60] In September 2022, the Task Force released its final report, providing 21 recommendations to Congress, the FAA, and the aviation industry.[61]

Section 612 of the law directed the FAA to create the Women in Aviation Advisory Board, which was tasked with "promoting organizations and programs that are providing education, training, mentorship, outreach and recruitment of women in the aviation industry."[62] In May 2020, the Department of Transportation (DOT) an-

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[53] *2022 Pipeline Report, supra* note 41.

[54] JetBlue, *JetBlue Gateways, available at* https://www.jetbluegateways.com/.

[55] Lindsay Bjerregaard, *AAR Plans For Expected Ramp-Up In Workforce Demand*, AVIATION WEEK, (Aug. 2020), *available at* https://aviationweek.com/mro/workforce-training/aar-plans-expected-ramp-workforce-demand.

[56] Leslie Josephs, *College of $70,000 a year? Aviation Industry scrambles for mechanics as retirements loom*, CNBC. (Sept. 2018), *available at* https://www.cnbc.com/2018/09/03/airlines-search-for-young-mechanics-as-retirement-wave-looms.html.

[57] Derek Costanza and Brian Prentice, *Recover and Rebuild Toward a Leaner, More Agile MRO Industry*, OLIVER WYMAN, *available at* https://www.oliverwyman.com/our-expertise/insights/2021/apr/mro-maintenance-repair-overhaul-survey-2021.html.

[58] Pub. L. No. 115–254 § 625, 132 Stat. 3405.

[59] FAA Briefing by Sean Torpey, Executive Director for National Engagement and Regional Administration, to H. Minority Comm. on Transp. and Infrastructure Staff, (Oct. 25, 2022, 2:00 PM EST) (slides on file with Comm.).

[60] Pub. L. No. 115–254 § 602, 132 Stat. 3400.

[61] *YIATF Report, supra* note 7.

[62] Pub. L. No. 115–254 § 612, 132 Stat. 3402.

nounced the appointment of 30 members to the advisory board.[63] The report issued by the Advisory Board in March 2022 provides, among other things, 55 recommendations to DOT, FAA, Congress, and the aviation industry on how to address barriers to recruiting, retaining, and advancing women in aviation.[64] Several stakeholders have requested that the Board be made permanent.

Unmanned Aircraft Systems Collegiate Training Initiative (UAS–CTI)

Sections 631 and 632 of the FAARA18 directed the FAA to establish a collegiate training initiative program relating to UAS by partnering with institutions of higher education to prepare students for careers in the UAS sector.[65] Additionally, the law directed the FAA to designate a consortia of public, two-year institutions of higher education as Community and Technical College Centers of Excellence in Small UAS Technology Training.[66] To comply with these requirements, the FAA launched the UAS Collegiate Training Initiative (UAS–CTI) program in April 2020. Under the program, "participating institutions will engage with the FAA, each other, general industry, local governments, law enforcement, and regional economic development entities to address labor force needs" to help provide students with the "skills needed to pursue a successful career in a UAS-related field."[67] The FAA has approved curricula for 111 schools under the program to date.[68]

Student Outreach Report

Section 601 of the FAARA18 directed the FAA to submit a report to Congress describing the agency's outreach efforts to elementary and secondary students interested in STEM careers in order to prepare them for aviation- and aeronautical-related careers and mitigate the anticipated shortage of pilots and other aviation professionals.[69] The FAA completed the report and submitted it to Congress in September 2019.[70] In the report, the FAA highlighted a 20 percent increase in the number of outreach representatives and a 50 percent increase in the number of its outreach events.[71]

FAA Cybersecurity Workforce Report

Section 549 of the FAARA18 required the National Academy of Sciences to study the FAA's cybersecurity workforce and develop recommendations to "increase the size, quality, and diversity of such workforce, including cybersecurity researchers and specialists."[72] The report was released in June 2021.[73]

FAA Technical Workforce Report

Section 569 of the FAARA18 directed the FAA to submit a report to Congress describing the progress made toward implementing the agency's action plan to attract, develop, and retain a talented workforce in the areas of systems engineering, architecture, systems integration, digital communications, and cybersecurity.[74] The FAA completed the report and submitted it to Congress in October 2020.[75] Among its recommendations, the report called on the FAA to focus on recruiting youth to build

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[63] DOT, *U.S. Transportation Secretary Elaine L. Chao Appoints Industry Leaders to Women in Aviation Advisory Board*, (May 15, 2020), https://www.transportation.gov/briefing-room/us-transportation-secretary-elaine-l-chao-appoints-industry-leaders-women-aviation.

[64] FAA, WOMEN IN AVIATION ADVISORY BOARD, FINAL REPORT, (Mar. 28, 2022), *available at* https://www.faa.gov/regulations__policies/rulemaking/committees/documents/media/WIAAB__Recommendations__Report__March__2022.pdf.

[65] P.L. 115–254 § 631, 632.

[66] *Id.*

[67] FAA, *More Schools Join the Collegiate Training Initiative*, (Sept. 2020), *available at* https://www.faa.gov/news/updates/?newsId=95838.

[68] FAA, UAS Collegiate Training Initiative (April 23, 2023), *available at* https://www.faa.gov/uas/educational__users/collegiate__training__initiative.

[69] Pub. Law No. 115–254 § 601, 132 Stat. 3400.

[70] FAA, SECTION 601 YOUTH IN AVIATION STUDENT OUTREACH REPORT, *available at* https://www.faa.gov/about/plans__reports/congress/media/Section__601__Youth__in__Aviation__Student__Outreach__Report.pdf.

[71] *Id.*

[72] Pub. Law No. 115–254 § 549, 132 Stat. 3378.

[73] National Academies of Science, Engineering, and Medicine, *Looking Ahead at the Cybersecurity Workforce at the Federal Aviation Administration*, (June 2021), *available at* https://www.nap.edu/resource/26105/FAA%20Cybersecurity.pdf.

[74] Pub. Law No. 115–254 § 569, 132 Stat. 3386.

[75] FAA, *Section 569 Report on Attracting, Developing, Training, and Retaining FAA's Technical Workforce, available at* https://www.faa.gov/about/plans__reports/congress/media/Report__Congress__FAA__Technical__Workforce__Sec569.pdf.

the agency's pipeline of technical talent, including high school and middle school students.[76]

V. WITNESSES

- Faye Malarkey Black, President and Chief Executive Officer, Regional Airline Association
- Dr. Sharon B. DeVivo, President, Vaughn College of Aeronautics and Technology
- Brad Thress, President and Chief Executive Officer, FlightSafety International
- Heather Krause, Director, Physical Infrastructure, United States Government Accountability Office
- Captain Jason Ambrosi, President, Air Line Pilots Association, International

[76] *Id.*

FAA REAUTHORIZATION: EXAMINING THE CURRENT AND FUTURE CHALLENGES FACING THE AEROSPACE WORKFORCE

WEDNESDAY, APRIL 19, 2023

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON AVIATION,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:02 a.m., in room 2167 Rayburn House Office Building, Hon. Garret Graves (Chairman of the subcommittee) presiding.

Mr. GRAVES OF LOUISIANA. The Subcommittee on Aviation will come to order. I ask unanimous consent that the chair be authorized to declare a recess at any time during today's hearing.

Without objection, so ordered.

I also ask unanimous consent that Members not on the subcommittee be permitted to sit with the subcommittee at today's hearing and ask questions.

Without objection, so ordered.

As a reminder, if Members wish to insert a document into the record, please also email the document to DocumentsTI@mail.house.gov.

I will now recognize myself for the purpose of an opening statement for 5 minutes.

OPENING STATEMENT OF HON. GARRET GRAVES OF LOUISIANA, CHAIRMAN, SUBCOMMITTEE ON AVIATION

Mr. GRAVES OF LOUISIANA. We have seen some pretty challenging times in the aviation sector over the past several years with COVID, with a huge drop in airline travel then a huge surge back. We have seen air traffic control run into incredible problems. And at the end of the day, it is our job to be looking at the impact on consumers; looking at the impact of the people that are the end users. And there are so many different components in the system. And I think that we are, sort of, the common thread that are supposed to be looking at this in how we ensure that there is compatibility, and that they complement one another.

When you look forward and you begin looking at the projections for pilots, for mechanics, for advanced aviation systems, you look at flight attendants, you look at TSA agents or security personnel, and you look at where we are, we are going off a cliff. And what I mean by that is that the challenges that we have seen in recent years just with air traffic control issues and other challenges in the

huge surge and drop in airline travel, that that will actually become common practice, meaning the disruptions, the lack of capacity, the higher prices, the delays, and cancellations, if we are unable to meet the projected demand.

And so, this hearing today is focused on how in this upcoming FAA reauthorization bill we are going to address workforce issues, an absolutely critical issue. This is the last hearing, I think, the fourth hearing that we have had on aviation. And I think it is appropriate that today that we close out by talking about the hard-working men and women that are the backbone of our aviation industry.

I want to thank the full committee Chairman Sam Graves for working with us and helping to identify the hearing topics that we have gone through. I want to thank my friend, Mr. Cohen, the ranking member, and Mr. Larsen, for their leadership issues and for their input on this as well to make sure that we are thinking about the big themes and thinking about the proper topics for the reauthorization bill.

If I look at, kind of, the last few weeks and months of hearings that we have had, there is no question that we are at a crossroads in civil aviation. But I also want to say that the aviation industry, I think, really is remarkable. Despite all the flaws and problems, and sometimes in spite of the solutions that Congress imposes sometimes in search of problems, we still have the safest, the busiest, and the most successful aviation system in the world. And all of the success is owed to the Nation's unmatched aviation workforce. And I want to thank again the men and women, the millions of men and women that make up that aerospace workforce.

Look, as we move forward, I think it is critical that we get input from the different sectors that are here today. And I will go through and say it again. Whether you are here representing pilots, you are representing airlines, you are representing general aviation, you are representing flight attendants, you are representing the mechanics, you are representing all the ground crews that are out there—you are representing this next generation, this advanced aviation that we are looking at. We have got to get this right. Because at the end of the day, if we don't, then the disruptions that we have seen over the last few years, quite frankly, aren't going to be anything.

And so, I think it is critical as we move forward that we look carefully at the weakest link. We have often found ourselves out there building up one component of it only to not have another. And, for example, look at what has happened recently with the constraining of capacity in the Northeast. We had a weak link. We had lack of capacity in one single sector of the aviation industry. We have had to actually pull back slots or constrain capacity. Coming back to what I said starting out, at the end of the day, it is about the consumer. If we are constraining capacity, we are reducing convenience, and we are probably increasing prices. And that is not the direction we need to be moving in.

So, in closing I am going to say this: We are well aware there are projections that make it crystal clear that we have got challenges ahead of us. And we have got to be thinking about how we can move forward in a way that meets the growing demand that

we are going to have but does it while maintaining the clear objective of convenience, of affordability, of safety, and making sure that we do this in a way that is smart and effective for taxpayers.

[Mr. Graves of Louisiana's prepared statement follows:]

Prepared Statement of Hon. Garret Graves of Louisiana, Chairman, Subcommittee on Aviation

When you look at the workforce projections for pilots, mechanics, advanced aviation systems, flight attendants, TSA agents, and others compared to where we are today—we can see very clearly that we're going off a cliff. What I mean by that is the challenges we've seen in recent years—dramatic drops and unexpected surges in consumer demands for airline travel, constraints for our air traffic control system—will become common practice. This means that disruptions, lack of capacity, higher prices, delays, and cancellations will continue if we're unable to get ahead of the projected demand for air travel. There are so many different components in this system, and we need to ensure that all aspects of the aviation industry are working in unison to support the public.

This hearing is focused on exploring how the upcoming Federal Aviation Administration (FAA) reauthorization bill could address these workforce shortages—an absolutely critical issue. This is the last hearing we will have had in the Subcommittee before we get to work writing that bill, and I think it's appropriate that today we close out by talking about the hard-working men and women who are the backbone of our aviation industry.

I want to thank the full Committee Chairman Sam Graves for working with us and helping identify the hearing topics we've gone through. I want to thank my friend, Mr. Cohen, and the Ranking Member, Mr. Larsen, for their leadership and their input on this to make sure that we're thinking about the big themes and proper topics for the reauthorization bill.

If I look at the last few weeks and months of hearings that we've had, there's no question that we're at a crossroads in civil aviation. The aviation industry really is remarkable. Despite all of the challenges it faces, we still have the world's safest, busiest, and most successful aviation system. I want to thank the many safety advocates including those in attendance today for continuing to push our system to new levels of safety.

We owe all of this success to the nation's unmatched aviation workforce. And I want to thank, again, the men and women—the millions of men and women—that make up that aerospace workforce.

As we move forward, it's critical that we get input from the different sectors that are here today. Whether you're here representing pilots, airlines, general aviation, flight attendants, mechanics, or all the ground crews—you're representing this next generation of our aviation system.

We've got to get this right. Because at the end of the day, if we don't, then the disruptions that we've seen over the last few years, quite frankly, aren't going to be fixed.

As we move forward, we must look carefully at the weakest link. We've often found ourselves out there building up one component of the holistic system, only to see another component suffer from a lack of attention and resources.

For example, look at what's happened recently with the constraining capacity in air traffic control capabilities in the northeast. We had a weak link. We've had to actually pull back flight availabilities in those airports to ensure that ATC is able to safely handle the number of flights in their region.

Coming back to what I said at the beginning of my remarks: at the end of the day, this is about the consumer. If we're constraining capacity, we're reducing convenience and probably increasing price, and that's not the direction we need to be moving in.

We are well aware that projections make it crystal clear that we've got workforce challenges ahead of us. We've got to be thinking about how we can move forward in a way that meets future demand while maintaining the clear objective of convenience, affordability, and safety. We have to ensure that we do this in a smart and effective way for our taxpayers.

Mr. GRAVES OF LOUISIANA. So, with that, I yield back my time, and I recognize Ranking Member Cohen for 5 minutes.

OPENING STATEMENT OF HON. STEVE COHEN OF TENNESSEE, RANKING MEMBER, SUBCOMMITTEE ON AVIATION

Mr. COHEN. Thank you, Mr. Chairman. And welcome, everybody. And I particularly want to say I am aware of the Colgan family that is here, and that you continue to represent your loved ones who were lost in that terrible, horrific crash. And you're here to see that we have safe and good transportation.

I am from Memphis, Tennessee, and Pinnacle Airlines, which ran Colgan, was out of my city. And I regret that, and they didn't run their airline necessarily as well as they should have. They ran it on the cheap. So, I apologize.

I look forward to hearing from our esteemed witnesses today as we seek to learn about how we can develop and diversify the U.S. aviation workforce. The aviation industry is approaching a critical juncture with respect to its talent development, especially the recruitment, training, and retention of individuals in its workforce.

A significant post-pandemic increase—everybody wants to travel—and an aging workforce are just two elements that have exacerbated the need for the FAA, Congress, and industry leadership to be vigilant in workforce development efforts. Without that, we can't have the airlines as they should be.

Partly due to recent staffing issues, the traveling public has had to deal with notable disruptions in air transportation over the past 24 months, with increases in commercial airline delays and cancellations, leaving millions stranded at airports. I just experienced that on Sunday when my plane was canceled. Alex, have we found out why yet?

STAFF. Not yet.

Mr. COHEN. Not yet. We have been trying—they said it was weather, but nobody else knows anything about the weather that would have done that, so, I was stranded.

Last year, 20 percent of flights arrived behind schedule, resulting in 1.3 million delayed flights. There were roughly 181,000 canceled flights in 2022, exceeding 2021. These statistics suggest Congress must move with urgency to intentionally develop the workforce and ensure U.S. air travel can continue to meet demands of our public.

And to ensure our safety remains the gold standard, we must shift the focus to cultivating new pipelines for upcoming aviation professionals to flow through. One obvious solution resides within collegiate aviation programs which help students transition from college to career on the flight deck, in airports, and repair shops.

In 2022, the Tennessee Board of Regents approved a new program at Southwest Tennessee Community College in my district which will help folks get into the airline industry with Federal Express in Memphis. We have those jobs available. It aims to keep those students in the aviation industry or to help them get into it. It's the first 2-year program of its kind in Tennessee and is poised to help diversify the aviation workforce.

There has been progress in the FAA's HBCU initiative program, and several commercial operators, such as Delta, have pathway programs aimed at diversifying their workforce.

Another great example in my district is FedEx, which has celebrated its 50th birthday. A birthday that when they came 50 years ago, it was transformative to package delivery in the world. And

to Memphis, it was a lifeline and a seamless relationship that continues and should continue forever. They have continued working with HBCUs to break down barriers for Black students, which is a large portion of our community in Memphis. They have created and funded three programs since 2021, which aim to empower and educate HBCU students while also connecting them to internships and mentorship programs within the FedEx network.

While these programs are helping to make progress, minority demographics are still severely underrepresented in commercial aviation. Black Americans constitute only 3.4 percent of professional pilots, 5.6 percent of airport management positions, and 9.5 percent of air traffic controllers, whereas women comprise only 20 percent of the aviation workforce.

To rectify this issue, strengthen the workforce, and protect the industry's longevity, the concepts of diversity, equity, access, and inclusion must be at the forefront of our endeavors.

I applaud the FAA, Congress, and the aviation stakeholders for their efforts thus far in helping move the needle in the right direction to develop the U.S. aerospace workforce. However, as we will hear from our witnesses present today, there is still more work to be done to ensure our workforce continues to grow.

I look forward to learning more about how our subcommittee can support this multifaceted development so equity and inclusion can become concepts embedded within all of aviation, making recruitment and retention challenges an issue of the past.

I come to this position with great joy in my work and an opportunity to do more good as being ranking member of the subcommittee. But it is a difficult journey for me because there might be a time or two I have to vote against my chair—and he is such a nice guy, and he is such a good human being—it is going to make it real hard for me. But I am going to do the best I can. I yield back the balance of my time.

[Mr. Cohen's prepared statement follows:]

Prepared Statement of Hon. Steve Cohen of Tennessee, Ranking Member, Subcommittee on Aviation

Thank you. I look forward to hearing from our esteemed witnesses today as we seek to learn more about how we can develop and diversify the U.S. aviation workforce.

The aviation industry is approaching a critical juncture with respect to its talent development, especially the recruitment, training, and retention of individuals in its workforce.

A significant post-pandemic increase in demand for air travel and an aging workforce, are just two elements that have exacerbated the need for the FAA, Congress, and industry leadership to be vigilant in workforce development efforts.

The reality is that without a robust workforce, planes cannot fly and people cannot travel safely.

For instance, partly due to recent staffing issues, the traveling public has had to deal with notable disruptions in air transportation over the past 24 months, with increases in commercial airline delays and cancellations, leaving millions stranded at airports.

Last year, 20 percent of flights arrived behind schedule, resulting in 1.3 million delayed flights. Furthermore, there were roughly 181,000 canceled flights in 2022, exceeding 2021 cancellations.

These statistics suggest that Congress must move with urgency to intentionally develop the workforce and ensure U.S. air travel can continue to meet the demands of the flying public.

And to ensure our safety remains the gold standard, we must shift the focus to cultivating new pipelines for upcoming aviation professionals to flow through.

One obvious solution resides within collegiate aviation programs, which help students transition from "college to career" on the flight deck, in airports, and in repair shops.

In 2022, the Tennessee Board of Regents approved a new program at Southwest Tennessee Community College in my district.

The program, which aims to help students enter the aviation industry, is the first two-year program of its kind in Tennessee, and is poised to help diversify the aviation workforce.

There has also been some progress made with the FAA's Historically Black Colleges and Universities (HBCUs) Initiative Program and several commercial operators, such as Delta Air Lines, have pathway programs aimed at diversifying the workforce.

Another great example in my district can be seen at FedEx through their collaboration with HBCUs to help break down entry barriers for Black students. They have created and funded three programs since 2021, which aim to empower and educate HBCU students while also connecting them to internships and mentorships within the FedEx network.

While these programs are helping to make progress, minority demographics are still severely underrepresented in commercial aviation.

For instance, Black Americans constitute only 3.4 percent of professional pilots, 5.6 percent of airport management positions, and 9.5 percent of air traffic controllers, whereas women comprise only 20 percent of the aviation workforce.

To rectify this issue, strengthen the workforce, and protect the industry's longevity, the concepts of diversity, equity, access, and inclusion must be at the forefront of all workforce endeavors.

I applaud the FAA, Congress, and aviation stakeholders for their efforts thus far in helping move the needle in the right direction to develop the U.S. aerospace workforce.

However, as we will hear from our witnesses present today, there is still more work to be done to ensure our workforce continues to grow.

I look forward to learning more about how our Subcommittee can support this multifaceted development so equity and inclusion can become concepts embedded within all of aviation, making recruitment and retention challenges an issue of the past.

Thank you.

Mr. GRAVES OF LOUISIANA. We can always just go for a walk. Thank you. I now recognize the chair of the full committee, Sam Graves, and somebody who's been a great aviation mentor for me, and I think knows more about aviation than anyone in this room. I recognize the chair for 5 minutes.

OPENING STATEMENT OF HON. SAM GRAVES OF MISSOURI, CHAIRMAN, COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

Mr. GRAVES OF MISSOURI. Thank you, Mr. Chairman. And I want to thank our witnesses for being here today. And I do want to commend Chairman Graves and Ranking Member Cohen for holding these hearings in advance of the upcoming FAA reauthorization.

I think it is very fitting that we kicked off our first series of hearings that we had with safety, because it underpins our entire aviation system. We are concluding today by focusing on the aerospace workforce. The men and women who keep the cogs turning in factories and repair facilities and cockpits and air traffic control towers across the country are not only instrumental to ensuring the safety of the traveling public, but they are also ensuring the global competitiveness of the American aerospace system. And now is the time to examine the challenges the aviation industry faces as we build and fly the advanced aircraft of the future.

As a professional pilot, I think about how pilot training has remained static over the years, except for the adoption of the 1,500-hour rule. We heard in our first hearing how we have established the gold standard in aviation here in the United States. But it is also true that many other countries have safe systems. And none of them have achieved their safety record by matching the 1,500-hour rule for the first officer, including the United States.

So, in our system, pilots with around 250 hours, typically very structured hours, come out of flight school, and they are left to bridge that gap to 1,500 hours. Only a few of those hours have any kind of requirements associated with them, and they can almost always be logged on a clear and sunny day.

I am not convinced that kids coming out of flight school and telling them they need to be towing banners or teaching students or boring holes in the sky while racking up debt produces the best pilots.

We all know what the FAA found, and that is the number of flight-hours you have are not a reflection of what kind of a pilot you are. I know some of our pilot groups out there like to point out that we haven't had an accident in the last 10 years. I want to go back through and examine those accidents because they point to the fact that they are not a result of the 1,500-flight-hour rule. If you go back and look at the accidents prior to 2010, not a single one had anything to do with the 1,500 hours.

You can classify accidents in two categories. You can classify them as mechanical failure, which the FAA determines is unrecoverable due to something happening to the aircraft. Or you can classify them as pilot error.

So, if you go back in 2004 at Pinnacle, what we saw was a severe lack of professionalism where the pilot in command had 7,000 hours, and he pushed the envelope during a ferry flight—and he did that intentionally, having fun—and it led to a loss of both engines.

In 2004, a Corporate Airlines pilot failed to properly execute a nonprecision approach. Both crewmembers had in excess of 1,500 hours.

Comair, in 2006, pilots attempted to take off from the wrong runway. Both crewmembers had well in excess of 1,500 hours.

And then we come to Colgan. The captain responded incorrectly to a stall warning that led to the loss of the airplane. Both crewmembers had well in excess of 1,500 hours. The captain had 3,379 hours, and the first officer had 2,244 hours. It had nothing to do with the 1,500-flight-hour rule.

We have got to find better ways to train safer and better skilled pilots and give folks the credit for the skill that they demonstrate or the high-quality training that they receive.

Just look at the military. You come out of the military, and you go into combat 300 hours. So, what we are saying is that pilots who have 300 hours are qualified to fly an F–15 for the Air Force or an F–18 for the Navy in combat, but they are not qualified to fly in the right seat of an airliner. They are qualified to fly in a C–17 or a C–130 hauling heavy cargo, but they are not qualified to fly in the right seat of an airliner.

We all know what happened in Buffalo. And I agree that the system covered up some problems. That is where we need to focus. We need to focus on what the problem is, not what the problem isn't. Anything less is an insult to the profession and the industry that relies on our pilots, to be quite honest with you.

And with that, I look forward to hearing from our witnesses about the ways that we can improve not only the pilot workforce, but other skilled professionals our pilots depend on to make sure that we deliver people and goods all over the country. And with that, thank you, Mr. Chairman.

[Mr. Graves of Missouri's prepared statement follows:]

Prepared Statement of Hon. Sam Graves of Missouri, Chairman, Committee on Transportation and Infrastructure

First off, I want to commend Chairman Graves and Ranking Member Cohen for holding these hearings in advance of the upcoming FAA reauthorization bill.

I think it's fitting that we kicked off our series of hearings with safety, which underpins our entire aviation system, and that we're concluding today by focusing on the aerospace workforce. The men and women who keep the cogs turning in factories, repair facilities, cockpits, and air traffic control towers across the country are not only instrumental to ensuring the safety of the traveling public, but also to ensuring the global competitiveness of the American aerospace industry.

Now is the time to examine the challenges the aviation industry faces so we can build and fly the advanced aircraft of the future. As a professional pilot, I think about how pilot training has remained static over the years, except for the adoption of the 1,500 flight-hour rule.

We heard at our first hearing how we've established the gold standard here in the United States, but it's also true that many other countries have very safe systems. And none of them have achieved their safety record by matching our 1,500 flight-hour first officer requirement.

In our system, pilots with around 250 hours—typically very structured hours—come out of flight school and are left to bridge the gap to 1,500 hours. Only a few of those hours have any kind of requirements associated with them, and even then, they can almost all be logged on sunny, clear days. I'm not convinced that taking kids out of flight school and telling them to tow banners, train students, or bore holes in the sky while racking up debt produces the best pilots.

We all know what the FAA found—that the number of flight hours you have are not a reflection of what kind of pilot you are. I know some of the pilot groups like to point out that we haven't had an accident in the last 10 years. So, I want to go back through and examine those accidents because they point to the fact that they are not a result of the 1,500 flight-hour rule. If you look at the accidents prior to 2010, not a single one had anything to do with 1,500 hours.

You can classify accidents in two categories. You can classify them as mechanical failure, which the FAA determines is unrecoverable due to something happening to the aircraft. Or you can classify them as pilot error.

If you go back to 2004, Pinnacle, what we saw was a severe lack of professionalism where the pilot in command had 7,000 hours, and he pushed the envelope during a ferry flight—and he did that intentionally—having fun. And it led to a loss of both engines.

In 2004, a Corporate Airlines pilot failed to properly execute a non-precision approach. Both crew members had in excess of 1,500 hours.

Comair, 2006, pilots attempted to take off from the wrong runway. Both the crew members had well in excess of 1,500 hours.

In the Colgan Air accident, the captain responded incorrectly to a stall warning that led to the loss of the airplane. Both crew members had well in excess of 1,500 hours. The captain had 3,379 hours and the first officer had 2,244 hours. It had nothing to do with the 1,500 hour rule.

We have got to find better ways to train safer and better skilled pilots and give folks credit for the skill they demonstrate or the high-quality training they receive.

Just look at the military. You come out of the military, and you go into combat with 300 hours. So what we're saying is pilots who have 300 hours are qualified to fly an F15 for the Air Force or an F18 for the Navy in combat, but they can't

fly in the right seat of an airliner. They're qualified to fly a C17 or a C130 hauling heavy cargo, but they're not qualified to fly in the right seat of an airliner.

We all know what happened in Buffalo, and I agree that the system covered up some problems. That's where we need to focus. We need to focus on where the problem is, not where the problem isn't. Anything less is an insult to the profession and the industry that relies on our pilots.

I look forward to hearing from our witnesses about ways we can improve not only the pilot workforce but also the other skilled professionals our pilots depend on to deliver people and goods around the world.

Mr. YAKYM [presiding]. Thank you, Mr. Chairman. Thank you for your opening remarks. I now recognize the ranking member of the full committee, Mr. Larsen, for 5 minutes for an opening statement.

OPENING STATEMENT OF HON. RICK LARSEN OF WASHINGTON, RANKING MEMBER, COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

Mr. LARSEN OF WASHINGTON. Thank you, Chair, for calling today's FAA reauthorization hearing to explore the challenges facing the workforce in aviation and aerospace.

American innovation, economic growth, and global leadership are impossible without the hard-working Americans that make up our Nation's aerospace and aviation workforce. These dedicated and talented individuals keep our skies safe and efficient; design, build, repair, and operate our most modern aircraft; and help ensure the traveling public arrives at their final destinations without incident—Representative Cohen's experience notwithstanding.

The last few years have exacerbated ongoing challenges faced in the industry and workforce. Congress has a responsibility to address these challenges to ensure that we retain a robust U.S. aerospace and aviation workforce now and in the future.

Recent projections show air travel is expected to reach pre-pandemic levels in North America by the end of this year. That growth is welcomed, but the industry has struggled to keep pace with this robust recovery that—thanks to decisive congressional action to sustain the industry during the pandemic—occurred much faster than anticipated.

Often at the forefront of this discussion is the availability and recruitment of U.S. commercial airline pilots. While there continues to be debate about whether the current or future supply of pilots is enough to adequately meet demand, here are some facts. FAA has reportedly issued an average of more than 6,200 new airline transport pilot—or ATP—and restricted ATP—or R–ATP—certificates every year since 2014. From 2017 to 2022, the number of new ATP certificates issued annually more than doubled, from an estimated 4,500 to 9,600 certificates. And the Bureau of Labor Stats—or BLS—projects the overall employment of airline and commercial pilots to grow 6 percent from 2021 to 2031.

Meanwhile, the U.S. maintains its role as a global leader in aviation safety in part due to the key safety rule requiring 1,500 hours of total flight time for pilots hired by U.S. airlines.

As many of us know, the standard was enacted following the Colgan Air flight 3407 that crashed near Buffalo in 2009. And I, too, would like to recognize the families who are here today who lost loved ones and thank them for their unwavering and con-

sistent advocacy in front of this committee and in front of Congress.

Since the establishment of this rule, the U.S. commercial airline industry has experienced one of the safest decades on record. And while the advancement of aviation technology such as full-scale flight simulators and other computer-based equipment are helpful tools in developing a more skilled and safer pilot workforce, there is no substitute for real-world flying experience on a flight deck. So, preserving the current safety requirements on training are critical to maintaining the U.S. gold standard in aviation safety.

Further, Congress, the FAA, and stakeholders must expand the pipeline of talent and improve efforts to recruit, train, and retain a robust workforce from every part of our society. To address this priority, the 2018 FAA bill invested $10 million annually in the section 625 Aviation Workforce Development Grant program to support the training and recruitment of new aircraft mechanics and pilots.

For example, in my hometown of Everett, Washington, Aviation Technical Services, or ATS, earned a $459,000 grant to support their apprenticeship and training programs which focus on introductory and displaced workers as well as veterans transitioning to civilian life. This grant program is widely supported by stakeholders. Unfortunately, despite receiving hundreds of applications, the FAA could only award 53 grants in the last 2 funding rounds. So, increasing the overall funding level for this program would also help alleviate the bottleneck in training.

And, finally, as our Nation works towards a long-term recovery, it is critical the educational and career opportunities in the aerospace industry be available and accessible to all Americans.

According to the latest census data, women represent more than half of the U.S. population, 50.8 percent, yet, only 3.6 percent of airline captains and 2.6 percent of aircraft mechanics. Further, more than 13 percent of the U.S. population is African American. However, only 3.4 percent of commercial air pilots are African American.

My point here is that there is an opportunity. The opportunity for the aviation and aerospace industry, not just to take the initial steps to enhance and diversify its workforce through creation of flight-training academies, apprenticeships, and other career programs, is that more can be done. And Congress must expand the pipeline of people entering aviation careers by increasing outreach to, and opportunities for, communities underrepresented in the industry. Because it is not just the right thing to do, but it is probably the most economically competitive thing that we can do to maintain the long-term health of the industry.

And so, I would look forward to the testimony today from our panel. And with that I yield back my negative 2 seconds.

[Mr. Larsen of Washington's prepared statement follows:]

Prepared Statement of Hon. Rick Larsen of Washington, Ranking Member, Committee on Transportation and Infrastructure

Thank you, Chairman Graves, for calling today's FAA reauthorization hearing to explore the challenges facing the U.S. aerospace and aviation workforce.

American innovation, economic growth and global leadership are impossible without the hard-working Americans that make up our nation's aerospace workforce.

These dedicated and talented individuals keep our skies safe and efficient; design, build, repair and operate our most modern aircraft; and help ensure the traveling public arrives at their final destinations without incident.

The last few years have exacerbated ongoing challenges facing the industry and workforce. Congress has a responsibility to address these challenges to ensure we retain a robust U.S. aerospace and aviation workforce now and in the future.

Recent projections show that air travel is expected to reach pre-pandemic levels in North America by the end of the year.

While this growth is welcomed, the industry has struggled to keep pace with this robust recovery that—thanks to decisive Congressional action to sustain the industry during the pandemic—occurred much faster than anticipated.

Often at the forefront of this discussion is the availability and recruitment of U.S. commercial airline pilots.

While there continues to be debate about whether the current or future supply of pilots is enough to adequately meet demand, here are the facts:

- The Federal Aviation Administration (FAA) has reportedly issued on average more than 6,200 new Airline Transport Pilot (ATP) and restricted (R–ATP) certificates every year since 2014;
- From 2017 to 2022 alone, the number of new ATP certificates issued annually more than doubled, from an estimated 4,500 to 9,600 certificates; and
- The Bureau of Labor Statistics (BLS) projects the overall employment of airline and commercial pilots to grow 6 percent from 2021 to 2031.

Meanwhile, the U.S. maintains its role as the global leader in aviation safety, in part due to the key safety rule requiring 1,500 hours of total flight time for pilots hired by U.S. airlines; commonly referred to as the "1,500-hour rule."

As many of us know, this standard was enacted following the tragic Colgan Air flight 3407 crash near Buffalo, NY in 2009—and I would like to recognize the families who lost loved ones for their unwavering advocacy; some of whom are here in person today.

Since the establishment of the 1,500-hour rule, the U.S. commercial airline industry has experienced one of the safest decades on record.

While the advancement of aviation technologies, such as full-scale flight simulators and other computer-based equipment, are helpful tools in developing a more skilled and safer pilot workforce, there is no substitute for real-world flying experience on a flight deck.

Preserving the current safety requirements on pilot training are critical to maintaining the U.S. gold standard in aviation safety.

Further, Congress, the FAA and stakeholders must expand the pipeline of talent and improve efforts to recruit, train and retain a robust U.S. aerospace workforce from every part of our society.

To address this priority, the 2018 FAA reauthorization law invested $10 million annually in the Sec. 625 aviation workforce development grants to support the training and recruitment of new aircraft mechanics and pilots.

For example, in Everett, Washington, Aviation Technical Services earned a $459,000 grant to support their apprenticeship and training programs, which focus on introductory and displaced workers, as well as veterans transitioning to civilian life.

This grant program is widely supported by stakeholders across the aerospace sector. Unfortunately, despite receiving hundreds of applications, the FAA could only award 53 grants in the last two funding rounds.

Increasing the overall funding level for the program would help alleviate this bottleneck. Furthermore, expanding the grant eligibility to include aviation manufacturing would help cultivate the skills necessary—particularly in innovative technologies—for the U.S. aerospace workforce to compete globally.

As our nation works toward long-term economic recovery, it is critical that the educational and career opportunities in the aerospace industry be available and accessible to all Americans.

According to the latest Census data, women represent more than half of the U.S. population—50.8 percent. Yet only 3.6 percent of airline captains and 2.6 percent of aircraft mechanics are women.

Furthermore, more than 13 percent of the U.S. population is African American. However only 3.4 percent of commercial pilots are African American.

The U.S. aerospace industry is taking the initial steps to enhance and diversify its workforce, through the creation of flight training academies, apprenticeships and other career pathway programs. But more can be done.

Congress must expand the pipeline of people entering aerospace careers by increasing outreach to, and opportunities for, communities underrepresented in the industry. It's not just the right thing to do, it's probably the most economically competitive thing we can do to maintain the long-term health of the industry.

The 2018 FAA reauthorization law created two expert panels—the Youth Access to American Jobs in Aviation Task Force and the Women in Aviation Advisory Board—to help address this issue and their final reports were completed late last year. The Committee is assessing their recommendations for inclusion in the upcoming reauthorization bill.

The current and future challenges facing the U.S. aerospace workforce are significant, but I believe we can meet them.

I look forward to hearing recommendations from today's witnesses on how we can enhance the talent pipeline for the aerospace workforce and ensure U.S. leadership in this growing sector.

Mr. YAKYM. Almost on time, Mr. Larsen. I would like to welcome our witnesses today and thank them for being here.

Briefly, I would like to take a moment to explain how our lighting system works. There are three lights in front of you. Green means go. Yellow means you are running out of time, so, wrap it up. And red means your time has expired.

I ask unanimous consent that the witnesses' full statements be included in the record.

Without objection, so ordered.

As your written testimony has been made part of the record, the subcommittee asks that you limit your oral remarks to 5 minutes. And with that, Ms. Black, you are recognized for 5 minutes for your opening statement.

TESTIMONY OF FAYE MALARKEY BLACK, PRESIDENT AND CHIEF EXECUTIVE OFFICER, REGIONAL AIRLINE ASSOCIATION; SHARON B. DEVIVO, ED.D., PRESIDENT, VAUGHN COLLEGE; BRAD THRESS, PRESIDENT AND CHIEF EXECUTIVE OFFICER, FLIGHTSAFETY INTERNATIONAL; HEATHER KRAUSE, DIRECTOR, PHYSICAL INFRASTRUCTURE, U.S. GOVERNMENT ACCOUNTABILITY OFFICE; AND CAPT. JASON AMBROSI, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

TESTIMONY OF FAYE MALARKEY BLACK, PRESIDENT AND CHIEF EXECUTIVE OFFICER, REGIONAL AIRLINE ASSOCIATION

Ms. BLACK. Thank you very much. Chairman Graves, Ranking Member Cohen, subcommittee members, I am Faye Malarkey Black, CEO of the Regional Airline Association. Thank you for including me.

Every airline worker holds the safety of passengers in their hands. My full statement covers more ground, so, I will focus now on the pilot shortage, which has grown for years while our industry contracted, small communities lost air service, and other airline employees lost jobs. Thank you for the payroll support program. It saved our industry. Still, we emerged smaller from the pandemic. Regional airlines did not shed pilots, but larger airlines saw 6,000 leave. Their replacements plus more for growth came from regionals.

Regionals turned to a pipeline that was higher than usual last year, but still qualified just 9,491 while 12 large airlines alone

hired 13,128. Today, 300 airports have lost air service, losing on average 1 in 4 flights. Eleven airports went dark. Some say these were profit decisions, so, let's settle the matter. Airlines do not shrink networks to profitability, nor park expensive assets unless they must. Today, we see stabilization, not recovery. And within 15 years, nearly half of all pilots will retire.

Networks use larger aircraft to cope, concentrating service at larger cities, while cutting frequency and markets. Passengers become drivers, while traffic fatalities claimed more than 40,000 lives last year.

Some have used data stripped of context to say the pilot shortage is not real. Some say a large mode around the career is needed to boost wages for those inside. Some say there is no pilot shortage, just a pay shortage.

Regional airlines' starting pay averages $100,000 for pilots. Bonuses can exceed $125,000. Five hundred jets are parked. Pay hasn't solved this. We need better career access.

Today's Federal Student Aid system fails pilots. Federal loans are short $80,000 or more. Airlines provide subsidized training and other supports, but lower income families can't bridge the gap.

Today's pilots are 96 percent White and 91 percent male. A racial wealth gap means cost barriers who hurt people of color most. Many work first jobs to afford pilot jobs. The average new hire is in their thirties, the median age for childbearing. RAA supports a bill expected soon to align student loans with flight education costs. This can't come soon enough.

We support use of 529 plans for flight training, and the GI bill for private pilot licenses. Pilots are high earners. Helping people fund training is the right thing to do, and it's sound economic policy. As solutions advance, we ask Congress to let experienced pilots fly until age 67, if they choose.

Raising the age will have immediate, positive effects, particularly as an acute captain shortage slows even first officers. No data shows a pilot is unsafe at 65, but this arbitrary line forces qualified pilots to retire when they have much to offer. These are mentors for the next generation, and they have our support.

Most importantly, RAA urges Congress to ensure that pilot qualification standards ensure qualified pilots. A rule change in 2013 required pilots to gain vastly more pre-hire flight time without support for pilots shouldering the burden. This was intended to improve pilot experience, but the reality has been different.

The same studies FAA used to craft the rule have been updated four times, and each shows that pilots now build time at the expense of the quality and the recency of their training.

The more time pilots spend building hours, the more the positive effect of their training fades. Despite the rhetoric, pilots do not encounter icing or thunderstorms or practice commercial flying procedures when they build this time. They fly light aircraft in clear weather. They arrive in our training programs with high time, but they are not ready. Failure rates have soared even though airlines have tightened screening and expanded training footprints repeatedly. Overreliance on hours has introduced risk, and we are compensating with remedial training.

We have not asked to change the rule. Congress has already provided the remedy directing FAA to approve training pathways that enhance safety, but just three exist with no actions since 2013. The operating environment has changed, and flight simulators and training devices have advanced. No airline would assume a 2013 training program remains relevant today, and the FAA should not either. FAA must keep up, and we ask Congress to keep watch.

There has never been a better time to be a commercial airline pilot, but we need safe policies to open doors to this transformational career. We will keep doing our part. We would like your help. Thank you again for the opportunity to testify today, and I look forward to your questions.

[Ms. Black's prepared statement follows:]

Prepared Statement of Faye Malarkey Black, President and Chief Executive Officer, Regional Airline Association

My name is Faye Malarkey Black. I am the President and CEO of the Regional Airline Association (RAA). Regional airlines play a critical role in the U.S. air transportation system, particularly for smaller communities. The safety of our passengers, crewmembers, and the public is and will always be our top priority. RAA appreciates the opportunity to testify before the Committee today and share our perspective on the current workforce challenges facing the airline industry and its impact on air service across the country.

I want to thank the Committee for its leadership during the pandemic. The Payroll Support Program provided a lifeline to airline industry employees. Likewise, the minimum air service guarantees put in place kept as many small communities as possible connected to the air transportation system during that challenging time. Unfortunately, the pandemic was particularly hard on the regional airline industry; several airlines shuttered or went through bankruptcy, and the industry emerged smaller than before.

THE REGIONAL AIRLINE INDUSTRY

RAA represents 18 regional airlines [1], which operate 41% of the U.S. scheduled passenger departures and directly employ more than 62,000 individuals. Regional airlines specialize in operating smaller aircraft that are rightsized for smaller markets. In 2021, regional airlines carried approximately 123 million passengers; a substantial increase from the 73 million carried in 2020, during the height of COVID, but still more than 40 million fewer passengers than carried in 2019. Regional airlines provide more than half of the air service in 30 states and more than 75% of the air service in 15 states [2]. Notably, regional airlines offer the only source of scheduled, commercial air service at 67% of U.S. airports. In fact, major airlines operate at about 33% of U.S. commercially served airports, while regional airlines operate at 98%.

Without regional airlines, huge segments of the U.S. population would not have access to scheduled, passenger air service without hours-long highway drives. For this reason, regional airlines play a crucial role in upholding multi-modal transportation safety. According to the National Highway Traffic Safety Administration and the Federal Highway Administration, Americans continue to drive more than during the height of the pandemic, and preliminary Federal Highway Administration data shows a 1.6% increase in vehicle miles traveled, or about 39 billion miles, with traffic fatalities claiming the lives of 31,785 people in the first nine months of 2022

[1] RAA Members are: Air Wisconsin, CommuteAir, Cape Air, Empire Airlines, Endeavor Air, Envoy, GoJet Airlines, Horizon Air, Jazz, Mesa Airlines, New England Airlines, Piedmont, PSA Airlines, Ravn Alaska, Republic Airways, Silver Airways, SkyWest Airlines

[2] Regional airlines provide 75% or more of the air service in Alabama (81%), Alaska (88%), Arkansas (81%), Iowa (78%), Kansas (82%), Maine (79%), Mississippi (82%), North Dakota (88%), South Dakota (85%), Vermont (92%), West Virginia (91%). Regional airlines provide half or more of the air service in Idaho (73%), Indiana (59%), Kentucky (60%), Michigan (57%), Montana (73%), Nebraska (60%), New Hampshire (69%), New Mexico (63%), North Carolina (55%), Ohio (52%), Oklahoma (55%), Oregon (54%), Pennsylvania (59%), Rhode Island (67%), South Carolina (57%), Utah (58%), Wisconsin (67%), and Wyoming (64%).

alone.[3] Compared to 2021, traffic fatalities increased 12% on rural interstates.[4] In 2021, the last year for which there is full data, traffic fatalities reached an estimated 42,915 deaths, a ten-year high.[5]

Because major airlines cannot serve smaller airports with their larger aircraft, most partner with regional airlines to provide air service to small communities. The goal of this arrangement is to bring air service connectivity and a seamless, safe, and reliable travel experience to passengers in every corner of the country. While regional airlines contribute significantly to civil aviation's overall $1.8 trillion economic footprint, air service at small communities (defined as small and non-hub airports) drove $152 billion in direct economic activity in 2019, supporting over one million jobs and $43 billion in local taxes and wages.[6]

ADDRESSING WORKFORCE CHALLENGES TODAY AND INTO THE FUTURE

The regional airline industry, like most of the airline industry, has experienced workforce challenges. Most acute among these challenges is a severe and ongoing pilot shortage. Regional airlines have adopted many self-help measures to address the shortage, but these measures are not enough alone. That is why we are focused on partnering with Congress, the Administration, and interested stakeholder groups to safely address the impacts the pilot shortage is having on our industry, passengers, and the communities we serve. Working together, it is critical that we increase equitable career access, reduce the cost barriers associated with pilot training, and update and modernize the training provided. These actions will expand the pilot development pipeline to include a more diverse population, while improving aviation safety and creating an environment where air service can be restored and grow.

THE REGIONAL AIRLINE INDUSTRY IS SUFFERING FROM A DEVASTATING PILOT SHORTAGE

Despite soaring passenger demand, a worsening pilot shortage has hindered the regional airline industry's recovery from the pandemic and is decimating small community air service. This shortage has been growing for decades, driven by the inability to create a sustainable pipeline of new pilots. One of the main challenges has been the FAA's inaction in advancing and evolving pilot training standards as envisioned under the Airline Safety and FAA Extension Act of 2010 (2010 Airline Safety Act.)[7] Most pilots only have access to an hours-based pilot qualification standard, which incorporates little actual training after completing flight school. To maintain safety, every regional airline has significantly expanded its training footprint, but more candidates fail out today than they did before the qualification standards favored flight time over quality training. This prevents air carriers from maximizing the pilot development pipeline.

The impacts of the pilot shortage are real. Currently, more than 500 regional aircraft are parked,[8] and those aircraft remaining in service are underutilized. The impact has been felt by 308 airports, or almost 72 percent of all U.S. airports. These airports have, on average, lost one quarter of their flights, with smaller airports experiencing a disproportionate impact.[9] This is happening despite industry self-help measures, including dramatic compensation increases and enhancing partnerships and pathways with training providers and larger carriers.

For decades, the airline industry depended on the U.S. military to provide a robust supply of well-trained pilots; however, due to a variety of factors, including the military's decision to disinvest in manned aircraft, that pipeline substantially diminished. Our collective long-term success in addressing workforce challenges will depend on our ability to hire civilian men and women from underrepresented backgrounds and demographics. Unfortunately, despite targeted efforts, airlines have not been able to successfully expand the recruitment of pilots outside the industry's core demographic, which is overwhelmingly comprised of white males. The main obstacles to accomplishing this goal are barriers to entry related to access and wealth; bottom line, this is an expensive career path.

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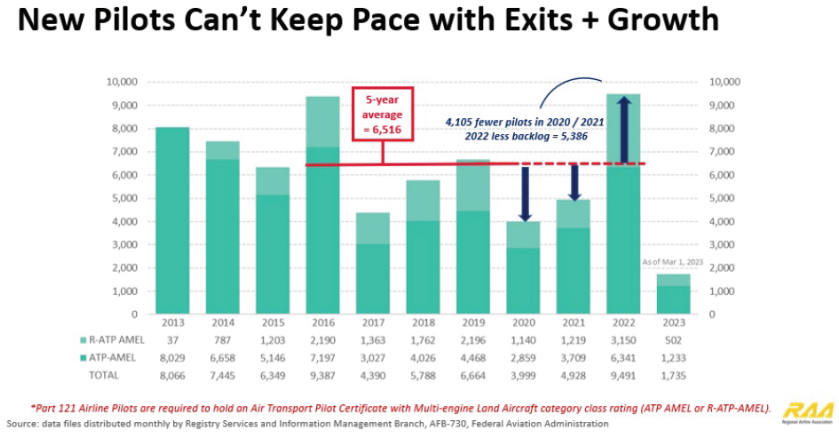
[3] https://www.nhtsa.gov/press-releases/nhtsa-estimates-traffic-deaths-2022-third-quarter
[4] Id.
[5] https://www.nhtsa.gov/press-releases/early-estimate-2021-traffic-fatalities
[6] https://www.raa.org/wp-content/uploads/2020/11/RAA__Annual-Report-2019__v33__bw.pdf
[7] P.L. 111–216 (August 1, 2010).
[8] https://www.flightglobal.com/fleets/nearly-500-regional-jets-parked-in-usa-cirium-fleets-data/152859.article
[9] *OAG published schedules April 2019 vs. April 2023*

Currently, the pilot shortage is further complicated by an acute captain shortage. Twelve large carriers alone hired 13,128 [10] pilots in 2022, sourcing nearly all these pilots from regional airlines. This hiring spree specifically targeted captains and captain-eligible first officers. Exacerbating the captain shortage is the forecasted growth in pilot retirements. Over the next fifteen years, approximately 50 percent of the workforce will be forced to retire. When a pilot—typically a captain—retires from a larger airline, this sets off a trickle-down effect of upgrades, ultimately resulting in a pilot—typically a captain or captain-eligible first officer—being hired from a regional airline. Because every flight needs a captain, and because there are more captains recruited by larger airlines than there are regional airline captains, or first officers eligible to upgrade and replace them, even first officer hiring is slowed, despite a growing shortage of all pilots. Thousands of willing, healthy, and skilled pilots, who would like to continue working, are being forced out of the profession at age 65, to the detriment of air service across the country.

THERE AREN'T ENOUGH QUALIFIED AND INTERESTED PILOTS AVAILABLE FOR HIRE

Despite increased FAA pilot certifications in 2022, there are not enough qualified and interested pilots for hire. Though 9,491 new pilots qualified in 2022—the highest number on record—it fell far short of the 13,128 hired by just one subset of the airline industry last year. It is vitally important that pilot production in 2022 be put in the proper context. COVID substantially disrupted the pilot development pipeline with roughly 4,105 expected pilot qualifications interrupted between 2020 and 2021.[11] Though 9,491 new pilots qualified in 2022, this ten-year high drops below the five-year average once adjusted for the pandemic backlog.

Additionally, many external factors influence the assignment of trends in pilot supply data. Just as COVID disruptions led to a ten-year high in pilot qualifications in 2022 when pilots caught up, a closing regulatory window accelerated qualifications in 2016—the second highest year on record—before a steep drop in 2017. Wide swings in qualifications, including increases or decreases of near or above 100% from one year to the next, illustrate both the need to control for data anomalies when drawing conclusions, and the fragility of pilot supply year over year.



In terms of the current pilot supply, we have no expectation that large carriers will slow the pace of hiring over the course of this year, thus limiting the opportunity for regional airlines to replenish their pilot ranks. On its last earnings' call, United Airline CEO, Scot Kirby stated, "We along with Delta, American, and Southwest alone are planning to hire about 8,000 pilots this year compared to historical supply in the 6,000 to 7,000 range. Pilots are and will remain a significant constraint on capacity." [12] Mr. Kirby also noted that other large air carriers are ex-

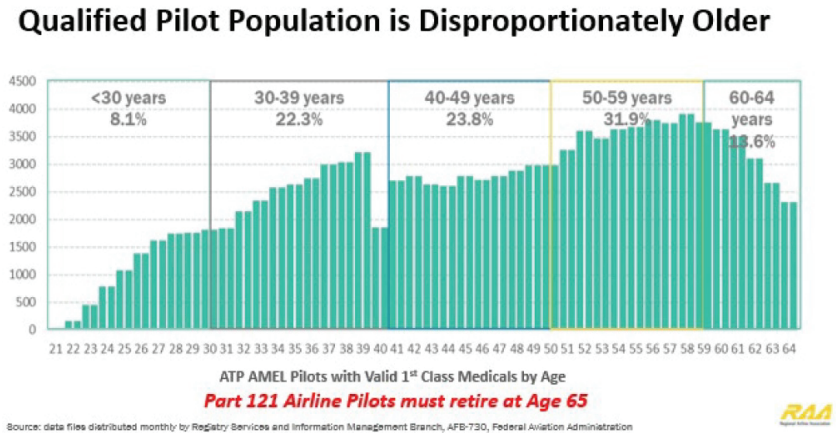
[10] https://fapa.aero/hiringhistoryarchive.asp?year=2022

[11] Analysis of data files distributed monthly by Registry Services and Information Management Branch, AFB–730, Federal Aviation Administration

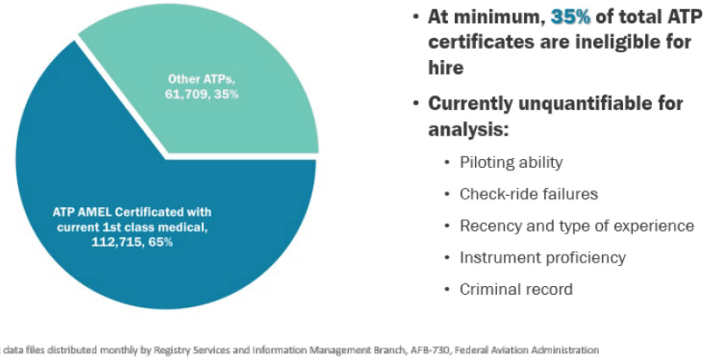
[12] UAL 4Q/FY22 Earnings Call, January 18, 2023. See: https://ir.united.com/static-files/5b5b2c9c-aa92-44da-ad37-753035bedd8d.

pected to hire around 2,000 pilots, indicating an overall demand of at least 10,000 pilots, which will be sourced primarily from regional airlines.

This demand is being fueled in part by of the coming tsunami of pilot retirements. Over the next 15 years, nearly 50 percent of the commercial airline workforce will be forced to retire because they will reach the age of 65. There are 70 percent more pilots aged 43 to 64 than aged 21–42. Reflective of the high cost of flight education and training, the "under 30 years of age" cohort of pilots is the smallest at around 8 percent of total pilots. This year, 2,225 pilots must retire. Required retirements will peak in 2029 at 3,750, when pilots aged 58 today turn 65. Thereafter, retirements remain high, staying above 2023's rate for the foreseeable future.



Equally important is the aggregate number of pilots that may be available to hire. More than one-third of the 174,424 ATP certificate holders in the FAA's Civil Airmen Database are ineligible for hire because either they are foreign pilots, or don't hold a first class medical, or have other disqualifying factors.



Of the remaining 112,715 pilots, we can determine how many are available to hire from the seniority lists for legacy, regional, low cost, national, and large cargo carriers, which totals more than 100,000 pilots. This leaves slightly over 12,000 pilots who aren't on seniority lists. Business aviation and charter operators also employ ATP pilots, making it reasonable to conclude that nearly every eligible pilot is already working.

When determining pilot supply, it is critical to include business aviation's need for ATP pilots in any forecast of pilot demand. For example, Boeing's annual forecast is regularly cited as an accurate forecast for pilot demand. Lately, it has been used to validate that the United States is producing enough pilots to meet demand since it projects a need of 6,400 pilots a year through 2041 for North America, which is below the average ATP production over the last 5 years. However, Boeing's forecast does not include demand for pilots from business aviation, regional airlines who operate aircraft with less than 30 seats, and helicopters. Boeing stopped including demand for these segments of the industry in 2021. However, it should be noted that in its 2020 forecast, when those groups were last included, Boeing projected an annual need of slightly over 10,000 pilots per year for North America through 2039.

High Barriers to a Pilot Career Compounds the Shortage

Unfortunately, as it relates to pilots, no amount of generated interest and no amount of investment in salaries can address the sky-high cost of flight education and training. Sadly, those costs keep many from pursuing the career path. Airlines are stepping into the void, but they can't advance a holistic solution that ensures financial access for everyone who is prepared to put in the work to become a pilot.

Flight education and training at an FAA-certificated pilot school costs around $80,000. This cost can then dramatically increase to over $200,000 when combined with the added expenses associated with a bachelor's degree. The result is that only the most fortunate or affluent pursue the career path, which is one of the chief reasons the pilot population has very limited diversity. According to the Census Bureau's Labor Force Statistics Demographic Data for Pilots & Flight Engineers,[13] the pilot profession is not diverse—95.7% of the profession identifies as White; 9.2 percent Female; 2.6 percent Black; 1.6 percent Asian; and 9.7 percent Hispanic. Even where economic background is not statistically associated with an underrepresented population, financial barriers that deter or prevent some candidates from pursuing training further constricts an already unacceptably narrow pool of potential candidates.

The high cost also makes it very difficult to grow the airline pilot populations under 30 years of age, which is by far the smallest cohort of working pilots at about 8 percent. The average age of a new hire regional airline pilot is in the mid-30s, which is also the median age for childbearing. Most pilots come to the profession as a second career and most have a college degree.[14] These pilots were long called to the career path but were only able to surmount the financial obstacles later in life after they had built up their own savings and credit histories.

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[13] Labor Force Statistics from the Current Population Survey, Bureau of Labor Statistics. *See* https://www.bls.gov/cps/cpsaat11.htm

[14] Pilot Source Study 2018: https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1198&context=jate

THE PILOT SHORTAGE IS RESULTING IN AN AIR SERVICE COLLAPSE

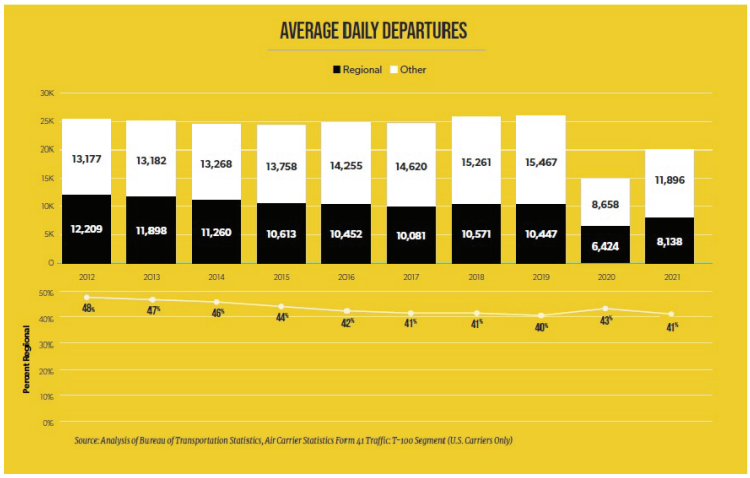
The pilot shortage has driven a wholesale collapse in small community air service. More than 500 regional aircraft are parked, and aircraft remaining in service are being operated between 20–40% less than their usual operation. Today, 308 airports in the contiguous United States, or 72 percent, have less air service now than they did prior to the pandemic. Comparing July 2019 departures to announced July 2023 schedules, network carriers have exited 73 markets, with almost all exits representing a loss of regional lift (See Appendix A).

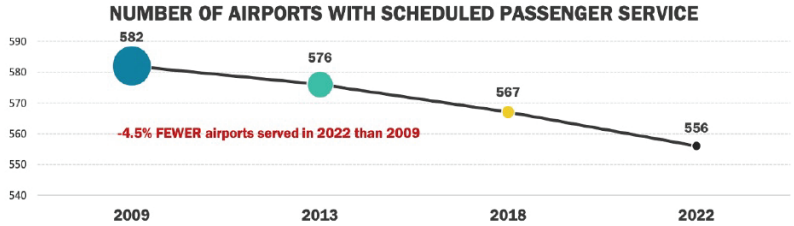
Comparing April 2019 flight schedules with April 2023, we see that the smallest airports in rural communities have lost the most service. Eleven airports have lost all their air service and 136 airports have lost more than 25% of their service. For the 53 nonprimary airports that lost flights, the average loss was 38 percent; 164 non-hub airports also lost flights and the average loss was 32 percent.

Larger airports, both large and medium hub are also seeing a loss of flights as they experience a reduction in air service and connectivity to and from small communities. Twenty-one large hub airports have lost on average 14 percent of their flights, and 21 medium hub airports have lost on average 16 percent of their flights. From a state-by-state air service perspective, 42 of 50 states have less air service today than they did pre-pandemic. Fourteen of these states have lost 20 percent or more of their service. (See Appendix B).

The regional airline pilot workforce was further diminished coming out of the pandemic. Network and major carriers, in full partnership with their pilot unions, brokered early exit packages that resulted in approximately 6,000 pilots separating from their employer. Although regional airlines granted virtually no early retirement packages to pilots, with the sudden return of demand, larger airlines replenished their pilots from the regional airline ranks. Simultaneously, all airlines have sought to increase pilot rolls to accommodate growth and ensure reliability amidst an increased in nonproductive pilot time under COVID and other factors.

Although these factors amplified the pilot shortage, the number of regional airline flight departures had already been declining for almost a decade due to the pilot shortage. During this time, numerous carriers ceased operating or filed bankruptcy due to a lack of pilots. In contrast, during this same period, larger carriers experienced an increase in flight departures, reflecting a more sufficient pilot workforce. Unfortunately, the contraction in the regional airline industry also led to the substantial loss of air service to smaller communities. Remarkably, these losses took place during periods of sustained economic expansion, when communities ordinarily see more, not less, air service.





Source: OAG Schedule Analyser, July Schedules, US Operations

The pilot shortage has resulted in a collapse in air service, and smaller communities are particularly impacted because they rely exclusively on regional airlines for air service. It is vital that Congress address the pilot shortage to ensure communities of all sizes have access to the National air transportation system.

Other Workforce Shortages Impacting the Regional Airline Industry

While the pilot shortage has made headlines, the regional and broader airline industry also face a deep shortage of aircraft mechanics. According to Oliver Wyman, the North American gap between the supply for mechanics and other aircraft maintenance workers and demand for them this year will be between 8% and 12%.[15] By 2027, the supply deficit could grow to between 24% to 27%, which represents a gap of between 43,000 and 48,000 workers. This shortfall could result in a maintenance backlog that leads to fewer flights, and more delays and cancellations.

This shortage is driven in large part by an aging baby boomer workforce that is preparing to retire, and an insufficient number of new or younger mechanics entering the profession. Thousands of mechanics retired early during COVID exacerbating the shortage. Today, most mechanics are over 40 years old, and less than ten percent of the workforce is between 18–30 years old [16].

While this shortage will impact everyone in the industry, certain sectors will feel it worse than others. As is the case with pilots, regional airlines serve as the entry point for mechanics and will be one of the segments most highly impacted by the shortage. Once mechanics gain skill and experience, many move on to work for major airlines, which are larger and can offer higher pay and greater advancement opportunities. As a result, the workforce at major airlines trends older, and they will face the wave of coming retirements sooner, forcing them to hire more talent from regional airlines and others. Additionally, regional aircraft are disproportionately older. Approximately 60 percent of the fleet is no longer being manufactured and older aircraft require more maintenance and upkeep. Importantly, returning parked aircraft to service involves complex and painstaking work to ensure they can resume flying safely. All systems must be inspected to ensure the aircraft is airworthy. When we address the pilot shortage, as many as 500 parked aircraft can start flying again to reconnect the country. Regional airlines will require an ample, well-qualified pool of maintenance technicians to return this fleet to service.

Another workforce shortage that is constraining the regional airline industry is the shortage of air traffic controllers. The controller workforce must be adequately staffed to minimize delays and disruptions to passengers. This summer, the FAA is asking all major airlines to reduce service by 10 percent at LaGuardia, Kennedy, and Reagan National Airport because of a controller shortage at the New York Terminal Radar Approach Control (NY TRACON) facility. As of 2022, regional airlines were responsible for 52 percent of the departures at Reagan, 46 percent of the departures at LaGuardia, and 18 percent of the departures at Kennedy. To compensate for these cuts, major airlines will decrease the number of regional aircraft flights to transport the same or more passengers on mainline narrowbody aircraft. This is the same response that major carriers have taken with the pilot shortage, and like the pilot shortage, the impact of the controller shortage at the NY TRACON will fall disproportionately on passengers from small communities. These passengers will endure reduced convenience, and more frustration and hardship when disruptions and delays occur amidst fewer flight options to set things right.

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[15] https://www.oliverwyman.com/our-expertise/insights/2023/jan/not-enough-aviation-mechanics.html

[16] US Bureau of Labor Statistics, Transport Canada, Federal Aviation Administration, Oliver Wyman analysis

ACTIONS BEING TAKEN BY REGIONAL AIRLINES TO ADDRESS WORKFORCE SHORTAGES

Regional airlines are investing in solutions to attract more people, especially pilots and maintenance technicians, to the regional airline industry. Part of this strategy includes higher pay. The average pay for newly hired regional airline first officers now exceeds $100,000 per year.[17] Regional airline pilot salaries are now approximately equivalent to first year, first officer salaries at network carriers.[18] Airlines have also made continuous investments in programs designed to spark career interest among candidates who have been historically underrepresented in the career.

As one important means of reaching diverse populations, regional airlines partner with organizations who regularly engage and support underrepresented candidates who are seeking aviation careers, such as the Organization for Black Aviation Professionals, National Gay Pilots Association, Women in Aviation, Sisters of the Skies, Latinos Pilot Association, Professional Asians Pilots Association, and others. This engagement includes supporting scholarship programs and attending events with these organizations to educate students on the careers and opportunities available to them.

Airline outreach is not limited to college-age students; carriers conduct outreach to students in elementary, middle, and high school in diverse school districts to help inspire an interest in aviation career paths. They also participate in aviation summer camps where students tour facilities and aircraft and speak with pilots and senior airline leaders about their jobs. All RAA members are engaging with their communities and offering opportunities that expose students to aviation.

Service members who are transitioning out of the military as well as veterans are also highly sought-after employees because they often have transferable skills and training that fits well within the airline industry. They also have unique life experiences and backgrounds they bring to their work. Carriers regularly conduct outreach on military bases that are near hub locations, attend job fairs and events, and work with staffing agencies and conferences that are specifically intended for recruiting individuals with a military background.

Additionally, many regional carriers have partnered with larger airlines to create pathway programs where pilots work at a regional airline before they move to a larger carrier. Pathway programs also partner with schools with diverse student populations, including minority serving higher education institutions like Historically Black Colleges and Hispanic Serving Institutions, as part of their recruitment and outreach efforts. These programs are designed to identify and prepare candidates for careers as pilots. Once admitted to the program, these candidates are mentored by individuals with similar backgrounds and life experiences.

Many airline employees also have long held aspirations to become pilots, however, like other individuals, the high cost of training has deterred them from realizing this dream. Some regional carriers, like Cape Air, have created internal programs to provide financial assistance to cover a portion of its employees' flight training expenses so that they can fulfill their dream of becoming a pilot. Republic Airways has opened its own flight training school called LIFT (Leadership in Flight Training) Academy that utilizes state of the art equipment and training practices to train the next generation of pilots. Students who successfully complete the LIFT career pathway program will have a guaranteed pathway to a career as a pilot at the air carrier. LIFT Academy costs $97,000 and Republic offers a $15,000 subsidy making training $82,000. After graduation, Republic offers an additional $15,000 in tuition reimbursement, making the cost $67,000. Supporting the LIFT academy is an aviation maintenance apprenticeship program in partnership with the U.S. Department of Labor. Apprentices earn as they learn over a 36-month period, and upon completion will be ready to begin a career as an aviation maintenance technician. These are but two examples. Multiple regional airlines have started training pathway programs in concert with their major airline partners.

RECOMMENDATIONS FOR ADDRESSING WORKFORCE SHORTAGES

If air service is to be preserved and eventually restored, urgent action is needed from lawmakers to advance near-term and long-term solutions to supplement the actions being taken by airlines and other aviation stakeholders to create a sustainable and well-trained workforce. Advancing near-term solutions for the pilot shortage is particularly important given that most of the workforce is rapidly approaching mandatory retirement age. It takes at least three years for a pilot to complete

[17] https://atpflightschool.com/become-a-pilot/airline-career/regional-airline-pilot-pay.html
[18] https://www.oliverwyman.com/our-expertise/insights/2022/nov/next-gen-pilots.html

flight training and build the required flight hours to qualify for an air transport pilot certificate (ATP) and hiring eligibility.[19] Those following four-year degree programs with restricted-ATP (R–ATP) authorization, typically take at least five years to become eligible for hire.[20]

For all workforce challenges, there is an urgent need for an enhanced partnership between the government, labor, and industry stakeholders to raise awareness about the transformational jobs available in aviation and to ensure that those pursuing these career paths have access to educational opportunities to develop the skills necessary for success.

SOLUTIONS FOR THE PILOT SHORTAGE

Near-Term Solution: Raise the Retirement Age for Pilots

Raising the pilot retirement age is the *only* solution before this Committee that will immediately provide the airline industry access to more pilots and help mitigate the air service losses that communities are experiencing today. For example, if the retirement age was increased to 67, aligning it with the current social security retirement age, an additional 5,000 pilots would have the option to continue working over the next two years. This is approximately the same number of ATPs produced in 2021. If the retirement age was increased to 68, which is the current retirement age for pilots in Japan, an additional 8,000 pilots could continue working over the next three years. It is for this reason that RAA supports the Let Experienced Pilots Fly Act of 2023 (H.R. 1761), which has been introduced by Congressman Troy Nehls (R–TX). We thank Congressman Nehls and Members of this Committee who have cosponsored this critical piece of legislation.

For the regional airline industry, increasing the retirement age is a particularly impactful solution because it will also help address the captain shortage. The overwhelming number of pilots who are approaching retirement age work at larger air carriers and when they retire, it sets off a domino effect of upgrades resulting in the departure of regional airline captains or captain ready first officers. Increasing the retirement age will slow attrition and provide regional carriers with the opportunity to stabilize their workforce. This in turn can help to preserve and eventually grow service to the communities that rely on us for air service.

As this Committee knows, Congress increased the retirement age from 60 to 65 in 2007. Aviation safety wasn't weakened then, and it won't be if the retirement age is increased again as long as existing regulatory safeguards that mitigate risk are continued. Today's older pilots must undergo mandatory medical examinations every six months. Additionally, all pilots have their skills regularly evaluated in flight simulators to ensure proficiency. Existing regulations also require two pilots in the cockpit. Because most Part 135 operators are not subject to a retirement age, pilots over the age of 65 are currently providing scheduled, passenger service safely as part of the EAS Program.

Long-Term Solution: Advance Aviation Safety by Expanding Structure Training Pathways and Incorporating Modern Technology in Pilot Training

RAA is not seeking, in any way, to reduce the pilot training requirements put in place in the 2010 Airline Safety Act. In that Act, Congress wisely gave the FAA the authority to allow for constant improvements to and modernization of pilot training programs. RAA is seeking the Committee's support to ensure the FAA fully utilizes its existing authority in a way that continuously enhances safety.

In the last ten years, there have been vast advancements in academic training programs, including flight simulation technology. Flight simulators allow instructors to build a robust curriculum and use high-fidelity simulation technology to train on emergencies, adverse weather conditions, and crew resource management techniques in a multi-crew environment. This allows mastery of skills that are crucial for commercial flying but are too dangerous to attempt or impossible to replicate in small, single-engine aircraft. Simulators also keep performance data to allow better

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[19] "In part 121 operations, each pilot in command (PIC) and each second in command (SIC) are required to have an ATP Certificate. Part 135 operations requiring the PIC to hold an ATP Certificate with an airplane category multiengine class rating are (1) commuter operations using multiengine airplanes with nine or fewer passenger seats (Scheduled 135), (2) on-demand operations using multiengine airplanes with 10 or more passenger seats, or (3) turbojets. Part 91K operations require all PICs of multiengine turbine-powered fixed-wing airplanes to hold an ATP Certificate." *See*: FAA Advisory Circular 61–138 (July 2, 2013).

[20] FAA regulations allow certain pilots with fewer than 1,500 hours of flight time to obtain a restricted privileges ATP certificate, which permits a pilot to serve as a co-pilot until he or she obtains the necessary 1,500 flight hours. *See*: https://www.faa.gov/pilots/training/atp.

evaluation of a pilot's performance and scenarios can be repeated until the skills have been mastered.

Unfortunately, today's R–ATP pathways have not advanced alongside these technological and programmatic developments and the safety benefits they offer. Structured training pathways offer *more* training, not less, and should be encouraged when they advance safety. The FAA must additionally ensure that hours spent using modern training methods and technologies that allow for such challenging and reality-based experiences are credited and weighted for pilots working to meet the 1,500-flight hour requirement. This will enhance safety, incentivize continuous improvements in pilot training programs, and allow new pilots to receive the best, most modern, and targeted training available.

In 2013, the FAA implemented its new First Officer Qualifications (FOQ) rule with the prerequisite 1,500-flight hours as one ATP training pathway. The FAA also established three other training pathways (R–ATPs), allowing some structured academic training to be credited toward flight hours. These R–ATPs allow military pilots to receive credit for 750-flight hours; graduates with a BA in aviation to receive credit for 500-flight hours; and graduates with an AA in aviation to receive credit for 250-flight hours.

In the last ten years, the FAA has not updated the FOQ rule to incorporate advancements in pilot training and flight simulator technology. Yet, when it was published, FAA acknowledged the rule did not exhaust the possibilities for R–ATP pathways. The FAA said the decision was based on the "*best currently available scientific data and information*," and in the rule explicitly noted the need for regulatory review:

> "In the future, however, FAA is likely to gather and analyze additional data in this area; for example, through safety outcomes resulting from this rule, and additional information collections associated with other rulemakings. . . . Because of the likely availability of such data in the future, the FAA may obtain additional empirical evidence relevant to the precise relationship between flight hours and types of training. For example, Phase III of the Pilot Source Study, explained elsewhere in this preamble, suggests areas for further research."[21]

Two updates of the Pilot Source Study used by the FAA in formulating the FOQ rule, have produced peer-reviewed, empirical data. Each study demonstrated that R–ATP pathways are superior to hours-based qualification pathways and further showed a marked deterioration of pilot skill occurs while pilots build undisciplined flight hours between foundational training and being hired by an airline.[22]

Notably, the FAA hasn't approved an R–ATP pathway for pilots who complete training at FAA-certificated flight schools, preventing the thousands of pilots from receiving more and better pilot training. It was Congress's intention to make safety enhancing pilot training improvements available to as many pilots as possible not just graduates of military and qualifying collegiate flight programs. In 2009, during consideration of the underlying bill, then Aviation Subcommittee Chairman Jerry F. Costello (D–IL) described this portion of the bill as follows:

> ". . . because pilot groups, the FAA administrator and flight education universities have all cited the need to strengthen pilot academic training, the bill allows the FAA administrator to give credit towards the 1,500-flight-hour requirements if a *flight school* or a university provides academic training that exceeds the strengthened minimum ATP requirements in the bill."[23]

In the years since the FOQ rule was adopted, only about one-third of pilots who receive their ATP do so through the R–ATP pathways. Entry to these pathways is limited by financial, geographic, and access barriers. Additionally, most pilots who complete flight training at flight schools already have a college degree and can't rationalize going back to school to get a professional pilot degree (an AA or BA.)

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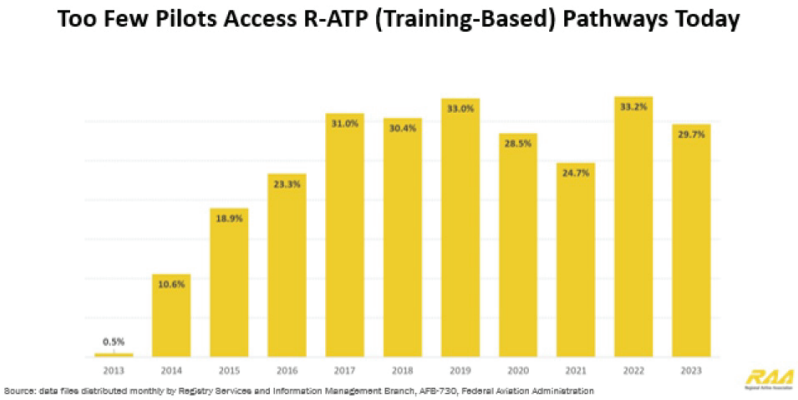
[21] https://www.faa.gov/regulations__policies/rulemaking/recently__published/media/2120-aj67.pdf — p 26)

[22] https://www.pilotsourcestudy.org, PSS 2015 and PSS 2018)

[23] CREC-2009-10-14-pt1-PgH11328.pdf (congress.gov); emphasis added.



Despite additional empirical evidence on the relationship between flight hours and types of training and despite huge advancements in pilot training programs and technology, the FAA has done nothing to carry out the intent of Congress or incentivize continual improvement in pilot training programs. Airlines and highly credentialed pilot training institutions are requesting more safety enhancing R–ATP pathways that integrate flight time with support from modern training technologies, flight simulators, and advanced flight training devices. This will unequivocally enhance aviation safety and improve pilot training and proficiency by ensuring that pilots get the relevant experience the right way.

Long-Term Solution: Remove Financial Barriers to Becoming a Pilot

Regional airlines are investing in solutions to attract more people into the career path and to retain our existing workforce. As noted, the average pay for newly hired regional airline first officers now exceeds $100,000 per year.[24] Additionally, according to the Bureau of Labor Statistics, the median annual wages for airline pilots, copilots, and flight engineers in scheduled air transportation was $207,000 in May 2021.[25]

Unfortunately, the life changing financial opportunities available to pilots working today, are walled off behind systemic barriers that impair career access. Chief among these barriers is the high cost of flight education and training, which on its own costs around $80,000, and can dramatically increase to over $200,000 when combined with the added costs associated with a bachelor's degree. Federal financial aid is insufficient to facilitate a financial pathway for undergraduate students. This forces those who don't come from wealth to borrow from private lenders with high interest rates, assuming their parents qualify or want to shoulder the financial burden. Many families lack the credit histories and scores necessary to qualify for aid and are locked out altogether. Unlike other career paths that require additional professional credentialing, such as doctors and lawyers, accredited pilot training programs can't access additional lending available through graduate aid programs to cover the higher costs.

This is why increasing the student loan cap for accredited flight education and training programs to help cover the higher costs associated with these programs is critical. This will provide a financial pathway to everyone, which will both grow and diversify the profession. RAA anticipates that legislation will be introduced soon in the House of Representatives to increase the student loan cap for accredited flight education and training programs and urges Members of this Committee to support it.

In addition to increasing student loan caps, lawmakers should consider expanding and amending the Section 625 workforce development grant program for pilots to enhance outreach to the next generation of pilots.[26] The workforce program should be expanded to support activities related to pilot recruitment and training to help ensure long-term growth and diversification of the pilot profession. Activities should

[24] https://atpflightschool.com/become-a-pilot/airline-career/regional-airline-pilot-pay.html
[25] https://www.bls.gov/ooh/transportation-and-material-moving/airline-and-commercial-pilots.htm#tab-5; last available data.
[26] FAA Reauthorization Act of 2018, sec. 625; P.L. 115–254 (October 5, 2018).

target outreach to school-age children and underrepresented populations along with training for commercial pilots.

Lawmakers should also consider expanding GI bill benefits to cover the full cost of flight training at FAA-approved pilot schools and allow the GI bill to cover private pilot certificates. Forcing veterans to pay for the private pilot certificates, which typically costs between $10,000 to $15,000, is a deterrent, and FAA-approved pilot schools are typically the lowest cost and quickest route to qualifying for an ATP. Passenger and cargo carriers no longer require commercial airline pilots to have a college degree, leaving little justification for continuing the current policy of discouraging veterans from pursuing this educational pathway. Lastly, flight education and training expenses incurred at FAA approved pilot training schools don't qualify for 529 plans—tax advantaged investment accounts that are used to save for a child's education. Lawmakers should support Rep. Mike Collin's (R–GA) Aviation Workforce Development Act (H.R.1818) to address the inequitable treatment of flight training programs.

SOLUTIONS FOR THE MAINTENANCE TECHNICIAN SHORTAGE

Expand Sec. 625 Grant Programs for Maintenance Technicians

Section 625 of the FAA Reauthorization Act of 2018 authorized $10 million to recruit and train maintenance technicians and pilots.[27] FAA initiated the program in 2021 and received more than 300 applications. Congress should expand the Maintenance Technician Program and make modifications to improve access to grant resources and ensure that successful programs can continue to receive funding and improve FAA's implementation.

Improve the Transition of Military Maintenance Professionals to Civil Aviation

The Aviation Technician Education Council estimates the civil aviation industry is capturing less than 10 percent of exiting veterans with aviation maintenance experience, in part because there is no clear path from the military to civil certification. The FAA reauthorization bill should include direction to the FAA to create a military competency examination that will provide a pathway to mechanic certification for servicemen and women, like what is available for military pilots. The FAA should also expedite repairman certificate applications for individuals with military technical experience applicable to aviation maintenance, even those from non-aviation specialties.

REGIONAL AIRLINES' TOP PRIORITY IS ADVANCING AVIATION SAFETY

Today's unprecedented level of aviation safety is because Congress, the FAA, and aviation stakeholders, have continually worked together to evolve how we both detect and respond to risks to ensure that the United States operates the safest aviation system in the world. This Committee can take much credit for the United States' amazing aviation safety record and the many safety improvements mandated in the last decade, including in the FAA Modernization and Reform Act of 2012, the FAA Extension, Safety, and Security Act of 2016, the FAA Reauthorization Act of 2018, and the 2020 Aircraft Certification, Safety, and Accountability Act.

Other key elements of this risk-based safety oversight system that have been developed and implemented by the FAA, industry, and labor in the last two decades include: the Commercial Aviation Safety Team (CAST); the Aviation Safety Information and Analysis Sharing (ASIAS) system; Aviation Safety Infoshare; the FAA's Safety Assurance System (SAS); and industry's Safety Management Systems (SMS).

Many of these safety systems and tools rely upon the use of unbiased, empirical data to detect, assess, and respond to risk appropriately. When this process is politicalized, the data is misrepresented or misinterpreted, or stakeholders are vilified, the process breaks down and risk is introduced.

For years, RAA has been raising the alarm that the 1,500-flight hour requirement is not having the intended effect of improving pilot training. Regional airlines have been warning that pilots entering airline training programs today are *less* prepared for the part 121 flying environment. This is because, despite their high flight time, they have not mastered swept wing jet aerodynamics, they lack crucial experience in congested airspace, they have no experience recovering from high altitude upsets, they have not experienced engine fires, failures, or other mechanical problems, they have never experienced icing, they have never operated in a thunderstorm, they have never experienced wind shear, and they have no experience operating in a

[27] Id.

multi-crew environment or using crew resource management, a cornerstone of flight safety.

In response to these deficiencies, regional airlines have had to act on their own to make sure that pilots have the relevant experience to fly for a commercial airline. Airlines must conduct remedial training to provide skills that should be part of a pilot's foundation but simply aren't. To keep flying safe, every regional airline has significantly expanded its training footprint to provide more classroom time, extra simulator and other training sessions, and have had to lengthen initial operating experience time before pilots are ready to fly. Airlines also fail out more candidates today than they did before the qualification standards favored flight time over quality training. The result is that too many pilots waste their time and money on flight training and time building that leaves them ill-prepared for working at a regional airline. RAA has never sought to weaken aviation safety, instead we have consistently called for improvements to pilot training because the current standard permits the accumulation of simple flight hours, including in a hot air balloon, that do nothing to improve pilot skills and instead lengthen the time since a pilot has completed training and becomes eligible for hire, a period where skills are lost today.

Impeccable, empirical data from numerous peer reviewed studies[28] have continued to validate the conclusion reached by the FAA years ago—that the 1,500-flight hour requirement has no relationship to accident prevention and does not enhance pilot training.[29] In fact, the same studies FAA relied on to formulate new standards have been updated several times. Most importantly to today's hearing, each has demonstrated the *fallacy of relying on flight time as a proxy for pilot experience, instead showing harm*.

Two separate Aviation Rulemaking Advisory Committees have also recommended that the FAA increase the number of R–ATP pathways. Unfortunately, these recommendations have been misconstrued, and in some cases, shouted down. Fear and emotion are injected into the conversation that should be based on facts and data. For over ten years, this has prevented incorporating advancements in pilot training methods, curriculum, and technology into the 1,500-flight hour framework. Improvements that are heralded and recognized as safety enhancing for commercial and airline pilots are somehow inappropriate and counter-productive for pilots with less than 1,500 flight hours despite being heavily utilized to train pilots outside the United States.

Last month, I joined Secretary Buttigieg and Acting Administrator Nolen at the FAA Safety Summit. Stakeholders were called together to address an increase in aviation incidents on taxiways and runways. The Acting Administrator urged attendees to ask ourselves difficult and sometimes uncomfortable questions to strengthen aviation safety. We need to apply that same standard to the 1,500 hour requirement to ensure we are producing the best trained, highest quality pilots in the world.

CONCLUSION

RAA and our members look forward to working closely with this Committee to advance solutions to the aviation workforce shortages, including the development of a strong supply of safe, well-trained pilots. Advancing long- and short-term solutions to aviation workforce shortages will be needed in order to stop air service loss and restore connectivity and the economic and societal benefits that air service brings. Above all, safety will remain our top priority. Every solution must ensure the continued safety of our passengers, crewmembers and the public.

Thank you for the opportunity to testify.

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[28] https://www.pilotsourcestudy.org/

[29] FAA Office of Aviation Policy and Plans Economic Analysis Division its Final Regulatory Evaluation Pilot Certification and Qualification Requirements for Air Carrier Operations, June 2013: "The FAA reviewed the accidents in the National Transportation Safety Board (NTSB) accident database over the period 2001–2010 and, based on broad search criteria, found 31 accidents where it appeared that the rule's training and type rating requirements might have prevented or mitigated the accident. AVP also attempted to quantify the benefits of the 1,500-hour requirement, but AVP found no relationship between the 1,500-hour requirement and airplane accident." *See*: https://www.regulations.gov/document/FAA-2010-0100-1925

APPENDIX A

Market Exits By Carriers that Partner with Regional Airlines

Comparison of Air Service from July 2019 vs. Announced Schedules for July 2023

Alaska Airlines		
DUT	Dutch Harbor	AK
American Airlines		
MEI	Meridian	MS
TOL	Toledo (US) OH	OH
HVN	New Haven	CT
PIB	Hattiesburg/Laurel (US) MS	MS
DRT	Del Rio	TX
JLN	Joplin	MO
ITH	Ithaca	NY
ISP	Islip	NY
DLH	Duluth	MN
CYS	Cheyenne	WY
OAK	Oakland	CA
SUX	Sioux City	IA
MHK	Manhattan	KS
SWF	New York	NY
LGB	Long Beach	CA
DBQ	Dubuque	IA
IPT	Williamsport	PA
Delta Air Lines		
EWN	New Bern	NC
AVP	Wilkes-Barre/Scranton	PA
ISN	Williston (US) ND	ND
CAK	Akron/Canton	OH
APN	Alpena	MI
SCE	State College	PA
FSM	Fort Smith (US) AR	AR
SWF	New York	NY
MHT	Manchester (US) NH	NH
ASE	Aspen	CO
PIA	Peoria	IL
PHF	Newport News/Williamsburg	VA
ERI	Erie	PA
COD	Cody	WY
GJT	Grand Junction	CO
FNT	Flint	MI
LNK	Lincoln	NE
LSE	La Crosse	WI
Hawaiian Airlines		
JHM	Kapalua	HI
MKK	Hoolehua	HI
LNY	Lanai City	HI
United Airlines		
PBG	Plattsburgh	NY
ELM	Elmira/Corning	NY

Market Exits By Carriers that Partner with Regional Airlines—Continued

Comparison of Air Service from July 2019 vs. Announced Schedules for July 2023

STS	Santa Rosa (US) CA	CA
MLU	Monroe	LA
UIN	Quincy (US) IL	IL
MMH	Mammoth Lakes	CA
CKB	Clarksburg	WV
CWA	Wausau	WI
ISN	Williston (US) ND	ND
RST	Rochester (US) MN	MN
CLL	College Station	TX
EAR	Kearney	NE
MKG	Muskegon	MI
EAU	Eau Claire	WI
SPI	Springfield	IL
ERI	Erie	PA
ITO	Hilo	HI
SHD	Staunton/Waynesborough	VA
LWB	Lewisburg	WV
VPS	Destin/Ft Walton Beach	FL
EVV	Evansville	IN
PUB	Pueblo	CO
PIR	Pierre	SD
FLG	Grand Canyon (US) AZ	AZ
CGI	Cape Girardeau	MO
LAN	Lansing	MI
GRK	Killeen/Fort Hood	TX
PAE	Everett	WA
AEX	Alexandria (US) LA	LA
PAH	Paducah	KY
AZO	Kalamazoo/Battle Creek (US) MI	MI
COU	Columbia (US) MO	MO
OGS	Ogdensburg	NY
ATY	Watertown (US) SD	SD

OAG Published Schedules July 2019 vs. July 2023

APPENDIX B

Comparison of Air Service By State April 2019 vs. April 2023

State	Sum of Frequency			% Change
	2019–04	2023–04	Grand Total	
AK	28,644	23,659	52,303	–17%
AL	3,857	2,977	6,834	–23%
AR	3,153	2,634	5,787	–16.5%
AZ	19,082	18,665	37,747	–2.2%
CA	76,243	65,396	141,639	–14.2%
CO	26,158	27,781	53,939	6.2%
CT	2,779	2,504	5,283	–9.9%
DE		47	47	100.0%
FL	60,776	63,126	123,902	3.9%
GA	38,618	32,671	71,289	–15.4%
HI	13,321	14,565	27,886	9.3%
IA	3,065	2,066	5,131	–32.6%
ID	2,506	2,598	5,104	3.7%
IL	44,618	34,966	79,584	–21.6%
IN	6,222	5,045	11,267	–18.9%
KS	1,470	1,261	2,731	–14.2%

Comparison of Air Service By State April 2019 vs. April 2023—Continued

State	Sum of Frequency			% Change
	2019–04	2023–04	Grand Total	
KY	8,037	6,455	14,492	–19.7%
LA	7,464	6,326	13,790	–15.2%
MA	15,856	15,274	31,130	–3.7%
MD	9,817	8,261	18,078	–15.9%
ME	1,844	1,611	3,455	–12.6%
MI	19,777	14,310	34,087	–27.6%
MN	15,995	12,269	28,264	–23.3%
MO	13,315	10,998	24,313	–17.4%
MS	1,484	1,272	2,756	–14.3%
MT	2,997	2,769	5,766	–7.6%
NC	32,241	27,721	59,962	–14.0%
ND	1,869	1,463	3,332	–21.7%
NE	3,085	2,459	5,544	–20.3%
NH	1,159	841	2,000	–27.4%
NJ	16,317	16,269	32,586	–0.3%
NM	2,843	2,732	5,575	–3.9%
NV	16,496	18,365	34,861	11.3%
NY	39,021	38,918	77,939	–0.3%
OH	10,931	8,209	19,140	–24.9%
OK	3,888	3,439	7,327	–11.5%
OR	9,179	7,432	16,611	–19.0%
PA	22,638	15,905	38,543	–29.7%
RI	1,696	2,147	3,843	26.6%
SC	5,883	6,058	11,941	3.0%
SD	1,305	1,132	2,437	–13.3%
TN	12,573	12,524	25,097	–0.4%
TX	71,735	68,492	140,227	–4.5%
UT	10,681	9,754	20,435	–8.7%
VA	27,590	25,036	52,626	–9.3%
VT	1,081	848	1,929	–21.6%
WA	20,270	18,865	39,135	–6.9%
WI	6,145	4,535	10,680	–26.2%
WV	1,017	778	1,795	–23.5%
WY	778	671	1,449	–13.8%
Grand Total	747,519	674,099	1,421,618	–9.8%

OAG Published Schedules April 2019 vs. April 2023

Mr. YAKYM. Thank you, Ms. Black. Dr. DeVito [sic], you are recognized for 5 minutes for your opening testimony.

Ms. DEVIVO. It's DeVivo, but that's OK.

Mr. YAKYM. DeVivo. I apologize.

TESTIMONY OF SHARON B. DEVIVO, ED.D., PRESIDENT, VAUGHN COLLEGE

Ms. DEVIVO. Members of the Subcommittee on Aviation, thank you so much for allowing me to speak to this esteemed group. I am honored to be part of this panel of engaged leaders who are working to provide opportunities to the next-generation workforce.

I come here today to offer two perspectives: The first is as the chair of the Youth Access to American Jobs in Aviation Task Force, a group of 21 members charged by Congress to look at how we pro-

vide a growing workforce pipeline to the aviation and aerospace industry. We developed 21 recommendations to address this challenge.

The second perspective is as the president of Vaughn College of Aeronautics and Technology, a private, nonprofit institution in New York City. We offer certifications and degree programs in aviation.

The task force provided a roadmap for implementation with a set of actionable items using documented best practices and initiatives designed to grow the workforce. The overwhelming evidence to our talent shortfall lies in young people from currently underrepresented groups who are unaware of the jobs available in this sector and the transformational opportunities they represent.

This industry has been an unknown opportunity for these communities, including rural communities. Building awareness needs to be begin at age 10 when students are exploring their passions and their interests are formed. The key to this effort is creating a one-stop-shop website. This resource for students and families would provide information and support to join the industry. Eighteen is the second critical time when students and families are making training and education decisions, and the pathway needs to be clearly defined and communicated.

The next hurdle is funding. We must also make the pathway affordable so that students from every economic background can pursue the needed credentials to join the workforce. Among the recommendations: decrease the cost of flight training by increasing the allowable simulator time for pilot certification; increasing the maximum Pell grant for students; developing a national aviation scholarship program; increasing donations to aerospace education programs; increasing the current FAA Workforce Development Grant program from $10 million to $50 million, as well as increasing funds to support the FAA's oversight of that program and leveraging their regulatory oversight to lower costs by updating its personnel and certification standards.

The connective tissue that links these recommendations together is the need to communicate at the regional and national level. We suggest a model based on the nine regions of the FAA.

The Regional Advisory Councils would collaborate on pathways, best practices, and resources with a representative from each regional council forming a National Advisory Council that would monitor efforts and design metrics for success. These councils could be managed and coordinated by the FAA's Aviation and Space Education Office.

We further encourage the FAA to seek out partnerships with the Department of Labor, the Department of Education, and others to facilitate communication and alignment of national priorities that shape training and certification pathways.

As an educational institution that serves a primarily underserved and underrepresented population, Vaughn College understands firsthand the challenges that students from underresourced communities face. We serve a population of about 1,200; 80 percent are from underrepresented backgrounds, and most are first generation.

The average family income for a Vaughn aviation maintenance student is about $34,000, and for all other programs, about

$42,000. An aviation maintenance student has a 55-percent gap between the cost of tuition and Federal and State financial aid and a 48-percent gap for all others.

For our flight students, the cost of training is an additional $75,000 to $85,000. Many families do not qualify for a parent PLUS loan and turn to the alternative loan market where the interest rates are high. Doubling Pell would provide greater financial support.

Congress could also consider the Flight Education Access Act to increase the subsidized and unsubsidized loan limits. Families could carry the debt with a competitive interest rate, and an income-based repayment option would allow affordable repayment.

Congress could also do more to support minority-serving institutions with grants for simulation equipment, curriculum development, and faculty, like the options available through the Department of Education with title V and title III grants. This effort could be coordinated with a cooperative relationship between the FAA and DOE.

The future will only become more challenging with advanced air mobility and uncrewed aerial vehicles. The current workforce demands do not factor in the technicians, pilots, vertiport managers, and engineers needed for these burgeoning fields. The FAA needs the staffing and operational support to meet these demands.

We have the roadmap, now we need commitment to invest in building a pipeline that supplies the workforce for the future. Thank you.

[Ms. DeVivo's prepared statement follows:]

Prepared Statement of Sharon B. DeVivo, Ed.D., President, Vaughn College

Members of the Subcommittee on Aviation, thank you so much for allowing me to speak to this esteemed group. I am honored to be part of this panel of engaged leaders who are working to provide incredible opportunities to the next generation of the aviation and aerospace workforce.

I come here today to offer two perspectives. The first is as the Chair of the Youth Access to American Jobs in Aviation Task Force (YIATF), a group of 21 members charged by Congress to look at how we provide a growing workforce pipeline to the aviation and aerospace industry. Our Task Force developed 21 recommendations to help move our country forward in addressing this challenge which we will face for the next two decades. The second perspective that I bring to you today is as the president and chief executive officer of Vaughn College of Aeronautics and Technology, a private, non-profit, Minority-Serving Institution located directly across the street from LaGuardia Airport. We offer master's, bachelor's and associate degrees as well as certificate programs in all aspects of aviation. We are a unique institution in that we offer a variety of entry points into the industry from a 16-month aviation maintenance training program and associate degrees that provide a pathway to air traffic control to an engineering degree that is coveted by aerospace companies seeking automation manufacturing expertise and a graduate degree in aviation management.

As you know, we face an unprecedented need for maintenance technicians and pilots for the next 20 years, according to Boeing and Airbus forecasts as well as engineers, air traffic controllers and airport managers. Right now, the United States is not producing enough qualified talent to meet the demand, which is why we must expand the existing pipeline to include opportunities for underserved populations especially minorities and women who have not been exposed to these fields. Prospective students and their families want to know that aviation is a high-tech, in-demand field with well-paying jobs and a solid career outlook.

The Task Force, comprised of individuals from industry, non-profits, trade associations, and educators completed their work this past fall and provided a roadmap for

implementation with a set of actionable items using documented best practices and initiatives designed specifically to open pathways for underrepresented and underserved groups. The Task Force determined four key areas where industry, education, youth-serving organizations and the federal government can work together to build the workforce pipeline. The areas include:

- Early Awareness and Engagement
- Building a One-Stop Shop of Information on the Web
- Collaborating to Create a Connected Pathway
- Funding the Opportunity

The overwhelming evidence pointed to the ready solution to our talent shortfall lies in young people from currently underrepresented groups who are unaware of the jobs available in this sector and the transformational opportunities they represent. For too long, this industry has been an unknown opportunity for these communities, including rural communities. Building awareness, based on our research, needs to begin at roughly at the age of 10 when students are exploring their passions and their interests are formed. Creating greater awareness at the middle and elementary school levels can lead to greater engagement at the high school level. Key to this effort is creating a one-stop shop website that could be coordinated by the proposed legislation for the National Center for the Advancement of Aviation Act. This website would act as a resource for students and families in finding out about organizations in that region to support interest, information about all of the career options available, the options for training and education as well as a resource for scholarships and other funding resources.

The other critical age, we learned, is 18 when students and families are making training and education decisions and the pathway to a transformational future needs to be clearly defined and communicated.

By building the awareness early, and providing role models who look like the students from unrepresented communities that we want to reach, we can increase the long-term engagement level, create a sense of belonging and lead young people to enroll in collegiate and technical training programs. Finally, we must make the pathway affordable so that students from low socioeconomic backgrounds can pursue the needed credentials to join the industry, whether aviation maintenance, flight or engineering.

After awareness of aviation, the single largest hurdle for young people to join the industry is funding. Among the seven recommendations made by the task force are: decreasing the cost of flight training by increasing the allowable simulator time for pilot certification; increasing the maximum Pell Grant for students; developing a national aviation scholarship program with specific criteria and approved programs; increasing donations to aerospace education programs by increasing corporate tax benefits; increasing the current FAA Workforce Grant Program from $10 million to $50 million as well as increasing funds to support the FAA's oversight of that program; and leveraging the FAA's regulatory oversight to lower costs by updating its personnel and certification standards.

The Task Force also made a recommendation for a longer-term multifaceted aerospace workforce development program to provide sustainable funding to nonprofit organizations and institutions so they can spend more time serving students and less time looking for funding. This program, along with other recommendations, is one of several that would require Congressional action. (Greater details for these can be found in the report which is available at: https://www.faa.gov/regulations__policies/rulemaking/committees/documents/index.cfm/document/information/documentID/5703)

We believe the connective tissue that links these recommendations together is the need to communicate at the regional and national level. We suggest a model, based on the nine regions of the FAA, that allows for better understanding of the aviation and aerospace needs of every sector of this country and a way to share our successes. The suggested Regional Advisory Councils would collaborate on pathways, best practices, resources and more with a representative from each regional council forming a National Advisory Council that would monitor efforts, share success from around the country and design metrics for success. Ideally, these Councils would be managed and coordinated by the FAA's Aviation and Space Education Office regional coordinators.

Without continuing this conversation beyond the Task Force, we will not make the progress we need to shape the workforce pipeline. That ability to work together was also identified by the Task Force at the federal level as well—we encourage the FAA to seek out partnerships with the Department of Labor (DOL), the Department of Education (DOE) and others to facilitate communication and alignment of national priorities that shape training and certification pathways. Two examples include: 1. Offer Job Corps training through a partnership between the FAA and DOL.

2. The FAA could collaborate with DOE on the various career readiness platforms available to high school students in a public-private partnership to provide the free flow of information about the myriad of job opportunities in aviation and the pathway to those options (more potential partnerships are suggested in the Task Force report, see link above).

As an educational institution that serves a primarily underserved and underrepresented population, Vaughn College understands firsthand the challenges that students from under resourced communities.

Founded in 1932, we offer master's, bachelor's, associate degrees and certificate programs in all aspects of aviation including flight, aviation maintenance, air traffic control (Vaughn is an FAA-approved Air Traffic-Collegiate Training Institute), flight dispatch, as well as engineering, airport/airline management and other technologies. We serve a population of about 1,200 students (500 students in aviation maintenance, 400 students in flight and airport/airline management and about 300 in engineering and engineering technology); 80 percent are from underrepresented backgrounds and most are first-generation Americans and first-generation college students. In our most recent incoming first-year class, 21 percent were women.

Our students are among the neediest. The average family income for a Vaughn aviation maintenance student is about $34,000 and for all other programs it is about $42,000. On average an aviation maintenance student has 55% gap between the cost of tuition and the financial aid available and for all other Vaughn degree programs the gap is 48%. In a recent survey of our students' financial circumstances, 72% worry about having enough money to pay for school and 20% ran out of money six or more times in the past year. In addition, 32% reported housing insecurity and 28% had very low food security with 40% working more than 40 hours per week.

For our flight students, the cost of flight training is an additional $75,0000 to $85,000 on top of tuition. Many of our families do not qualify for a PLUS loan (the traditional loan offered to parents of students) because of their credit scores or lack of credit and must turn to the alternative loan market where the interest rates are much higher. Doubling Pell would provide the financial support that our students need to achieve their goals and get them to the industry. Congress should also consider the Flight Education Access Act, which would significantly increase the subsidized and unsubsidized loan limits. This would allow families to carry the debt with a competitive interest rate, and given the fact that new graduates must still complete hundreds of hours of flight time as Certified Flight Instructors at an hourly pay rate of less than $30 an hour, an income-based repayment option through the federal government would allow that student to afford those loan payments while also covering basic needs.

When students graduate the outcomes are exceptional: Within one year of graduation 92% of those students are employed or continuing their education (prior to the pandemic we were at 99%; 76% in their field. For graduates who pursue an aviation maintenance degree or certification, those skills are also transferable to a variety of fields including other forms of transportation, offshore and onshore wind, public utilities and manufacturing.

In a 2017 study done by the Equality of Opportunity Project published in the New York Times (that has not been replicated), examined more than 2,100 institutions that were the best at moving students from the bottom 40 percent in income to the top and Vaughn was number one in the country. That is the evidence of the transformation possible with a Vaughn education, and by extension an aviation education, and we not only change that student's life we change the whole family's trajectory. In addition, in a study by Georgetown University's Center on Education and the Workforce in 2020, Vaughn ranked in the top 4% of colleges where low-income students get the highest return on investment. As a result of this overwhelming evidence, we made a strategic decision to offer our full-time bachelor of science and associate in aviation maintenance students the *Vaughn Guarantee*—if they remain enrolled full-time during their studies and meet regularly with our career services office and are not employed within one year we will pay their federal loans for one year. Our students and families are primarily concerned with affordability and the assurance of a career path, and this Guarantee is a declaration that Vaughn considers this a true partnership for student success.

Queens is incredibly fortunate to have an aviation ecosystem that could act as a model for other major metropolitan areas. That ecosystem includes education partners like Aviation High School who we support with "Bridge to College" programs, partnering on Women in Aviation Events, scholarships and more. Between these two institutions, we are one of the largest producers of technicians to industry. Our other outstanding partners include the Port Authority of New York and New Jersey, Delta, Endeavor, Republic, JetBlue, United and the Cradle of Aviation Museum, among others, to provide a clear career pathway.

At Vaughn, we host the Scouting community with interactive workshops, have developed a math program with a local middle school that provides a pathway to high school and then Vaughn, our students offer demonstrations at museums like the Cradle of Aviation, and we host awareness events in cooperation with JetBlue and United at the New York Hall of Science, as well as send Vaughn students to participate in a variety of secondary school events. These programs create the early awareness needed to draw individuals traditionally not well represented in the industry.

Congress could do more to support Minority-Serving Institutions specially with grants for simulation equipment, curriculum development and faculty like the options available through the Department of Education with Title V and Title III grants (of which Vaughn recently was awarded for $3 million over the next five years to invest in our facilities, faculty and program in aviation maintenance).

Vaughn's 90 years of expertise in aviation education provides us with a unique vantage point and a legacy of students who fuel one of this nation's leading economic drivers, and the horizon while it looks incredibly bright will only become more challenging with advanced air mobility and uncrewed aerial vehicles. All the current workforce demands do not even factor in the maintenance technicians, pilots, airport managers and engineers needed for these burgeoning fields. To meet the need for a qualified and well-trained workforce we must create awareness in communities that can be the greatest contributors to the aviation industry by providing early awareness, access to a connected pathway, easy access to more information about the variety of pathways via the web, and an affordable way to achieve the dream of a fulfilling career that provides the American dream. Aviation and aerospace are and can continue to be that for more Americans if we have the willingness and the commitment to invest now in building a pipeline that supplies the workforce for the future.

Mr. YAKYM. Thank you, Dr. DeVivo. Hopefully, I got it right that time.

Mr. Thress, you are recognized for 5 minutes.

TESTIMONY OF BRAD THRESS, PRESIDENT AND CHIEF EXECUTIVE OFFICER, FLIGHTSAFETY INTERNATIONAL

Mr. THRESS. Thank you, Vice Chairman Yakym.

Ranking Member Cohen, Ranking Member Larsen, and members of the subcommittee, on behalf of FlightSafety International, thank you for the opportunity to testify today. I am Brad Thress, president and CEO of FlightSafety.

I would like to start by saying as a lifelong aviator and a former Air Force pilot, type rated in several commercial and business jet aircraft, I am very passionate about the safety of our industry, and it is the focus of our entire company.

FlightSafety trains pilots, maintenance technicians, cabin personnel, dispatchers, and drone operators for business aviation, defense, and the commercial airlines. We also engineer and manufacture our own simulators at our factory in Broken Arrow, Oklahoma.

Simulator flight training is an integral part of the safety improvements achieved by the aviation industry over the last several decades. It has proven to save lives. It is a regulatory requirement around the world, and it is also required by insurers of complex airplanes.

Globally, over 1,500 civil full-flight simulators are in operation. Sims are certified to accurately recreate the experience of flight operations. They provide a fully immersive experience. Pilots are qualified in new types 100 percent in the simulator. The first time they fly the airplane is typically with passengers in the back.

The full-flight sim you see pictured here on the left consists of three major assemblies. An exact duplicate of a full cockpit, which

you can see in the upper right picture, a high-definition wrap-around visual system and a motion base. The average cost of a full-flight sim is $12 million. And they simulate operations anywhere in the world in all weather conditions.

Simulators also enable flightcrews to experience all possible aircraft malfunctions, many of which are impractical to train in the aircraft because it is unsafe. Between 2020 and 2022, 488 accidents occurred during training flights. That is 11 percent of all accidents. These accidents resulted in 70 fatalities.

Simulators also allow crews to experience rare events like rapid decompressions and emergency descents, high-speed rejected take-offs, and dual engine failures.

Full spectrum of operating environments are also available in the simulator. We train environmental events like wingtip vortices encounters, wind shear, cold-weather operations in snow and ice, and mountainous airport operations in poor weather. We also train special operating procedures like the approaches into Washington Reagan.

Just as a flight-hour of combat training in an F–35 differs dramatically from an hour in a 172, an hour of simulator training is far more valuable than an hour in a single-engine aircraft. The two pictures on the right contrast the experience of the simulator on the upper right and the single-engine airplane on the lower right.

Since 2013, airline copilots are required to have 1,500 hours, just like airline captains. It is very expensive to build this time which drives many of these hours into single-engine aircraft where the experience is not relevant to commercial operations.

Simulator training duplicates the full commercial operating environment. The impact of the simulator experience could be expanded by increasing the credit allowed toward the 1,500 hours. Currently, a maximum of 100 hours of sim time are allowed, which is just 7 percent of the requirement. Increasing this to a more significant portion would enhance the preparedness of the pilot workforce.

I will conclude by saying flight simulators are proven technologies; they are here today; the industry relies on them. Increasing their use will give pilots a much stronger and relevant body of experience and enhance the safety of the aviation industry. I will yield back my time.

[Mr. Thress' prepared statement follows:]

Prepared Statement of Brad Thress, President and Chief Executive Officer, FlightSafety International

Chairman Graves, Ranking Member Cohen, Chairman Graves, Ranking Member Larsen, and members of the Subcommittee, on behalf of FlightSafety International and our employees, I thank you for the opportunity to testify today. My name is Brad Thress, and I am the President and CEO of FlightSafety International. As a life-long aviator and former Air Force pilot rated on several commercial and business jet aircraft, I am understandably passionate about this topic.

INTRODUCTION

FlightSafety International (FSI) is a U.S. company with over 4,900 employees in 36 states. As a leading supplier of advanced, simulator-based training for business, defense, and commercial airline pilots, maintenance technicians, and cabin crew, FSI has had a single focus for over 70 years; increase the safety of aviation through world class training for air crew members and maintainers.

FSI offers initial, recurrent, advanced and special operations pilot training and provides access to cutting-edge simulator technology, specially designed training environments, and the expertise of professional FAA and European Aviation Safety Agency (EASA)-qualified instructors. As a training provider, FSI trains 82,500 people annually, including approximately 52,000 civil pilots and 5,700 military pilots.

Other training provided by FSI includes initial and updated aviation maintenance training for professional technicians, Aircraft Dispatcher, Corporate Scheduler/Dispatcher, and Operations Control Specialist for Helicopter Air Ambulance training. FSI also offers professional drone training with a program built upon experience with UAS training for the military and decades of experience in international corporate aviation.

MODERNIZING AVIATION WORKFORCE TRAINING

The current multifaceted challenges facing the aviation industry and their impacts to air service have highlighted the need to modernize workforce training programs. FSI designs, manufactures, and installs new simulators, advanced training devices, classrooms, aircraft systems, and crew emergency trainers. FSI is an expert in the design, manufacture, and support of Level D-qualified full flight simulators, advanced flight training devices, visual systems and displays. FSI also develops comprehensive, state of the art interactive courseware, using traditional and virtual technologies, and FSI simulators faithfully replicate the look, feel, and performance of customers' aircraft.

In the last decade, flight training device and simulation technology have made enormous advancements. Training provided in these devices allows greater exposure to the multi-engine, multi-crew airline environment pilots must be able to master. In addition, student pilots can experience emergency situations, weather, and other events in a realistic, but virtual setting. These are experiences they cannot gain flying solo in a small, single-engine aircraft.

The following are some of the advancements in-flight training device and simulation technology that FSI has achieved:

- Image generation products that bring training to life with seamless, powerful, and realistic training scenarios.
- Advanced simulations, including sensor simulation and a wide variety of high-fidelity weather systems and effects, with up to 64,000 atmospheric layers.
- Physics-based weather models, including:
  - Atmospheric scattering;
  - 3D clouds, including storm clouds with volumetric and in-cloud effects, rain shafts and correlated radar profiles;
  - 2D and 3D oceans, including two swell states, ocean wave and spray effects, and geo-specific littoral ocean water coloring;
  - Runway, taxiway, and area geo-specific contaminants; and
  - Dynamic precipitation, such as physics-based rain, snow with accurate density and motion, and bouncing hail.
- A wide variety of animation types and controls featuring outstanding visibility attenuation, weather, physics-based lighting, and special effects.
- A variety of animation controls that can be combined and chained together to create numerous complex effects, including:
  - Particle-based simulations such as dust clouds, brown outs, whiteout, obscuration effects, smoke, downwash, and more; and
  - A variety of sensor trigger-based animations.
- An extensive library of airports, photorealistic moving models, and high-detail areas with urban culture and vegetative density.
- Glass mirror displays with superior optical performance, sharper image clarity, and significant advances in fidelity and field of view. Displays fill the entire aircraft window, with the largest field-of-view on motion of up to 300 degrees horizontal and 60 degrees vertical.

FULL FLIGHT SIMULATORS

Full flight simulators are certified to accurately recreate the experience of actual flight operations. They consist of an exact duplicate of a full cockpit, high-definition visual system, and motion base. The average commercial simulator costs approximately $12 million. They produce exact simulations of operations anywhere in the world and in all weather conditions. They also enable flight crews to experience all possible aircraft malfunctions and operational scenarios safely and realistically. FlightSafety engineers and manufactures our own simulators in Broken Arrow, Oklahoma. We operate 386 simulators in 16 states and 6 countries.

ENHANCING AVIATION SAFETY

Simulator based flight training is an integral part of the safety improvements achieved by the aviation industry over the last several decades. Experience gained in flight simulators empowers aviators to safely handle situations from routine to the most critical emergencies. This training is proven to lower risk and save lives. Because of its powerful impact on safety, simulator-based flight training has become a regulatory requirement around the world. It is also required by aviation insurers for complex aircraft. Globally there are over 1,500 civil simulators in operation

Most critical training elements are impractical to reproduce in the aircraft because it is unsafe and can damage expensive system components. During the last three years eleven percent of accidents occurred during training flights. To mitigate these risks, in-aircraft training is limited to partially accurate scenarios practiced in unrealistic environments.

Simulator training allows crews to fully experience all possible events even rare ones. Simulators also allow crews to experience a full spectrum of operating environments such as snow, icing, wind shear, and high-altitude airport takeoff and landings. They are used to expose pilots to special operating procedures at specific airports around the world like the special approaches into Washington Reagan. At FlightSafety we construct precise scenarios using actual operating data recorded aboard the aircraft. We create scenarios tailored to improving a specific pilot's performance in areas shown by his or her aircraft data to need improvement. We also aggregate this aircraft data and build training profiles based on current airports and approaches that have higher accident risks.

VALUE OF SIMULATOR TRAINING HOURS

Industry and airworthiness authorities around the world recognize the increased safety achieved by training in full flight simulators and flight training devices. For the last ten years U.S. airline first officers have been required to have 1,500 hours of flight time just like airline captains. Because flight time is very expensive, aspiring aviators accomplish most of their hours in more affordable, simple, single-engine aircraft. Training hours performed in certified full flight simulators as well as other flight training devices build much more experience, and are therefore much more valuable, than flying light, single engine piston aircraft in visual conditions.

In addition, the flight experience obtained in light aircraft is not relevant to the type of operation professional pilots experience. It primarily takes place outside of the airspace above 18,000 feet and around busy airports, where the vast majority of commercial operations take place. It is primarily accomplished in the daytime, in clear weather rather than at night or in inclement weather, and it purposely avoids the types of operational complexity that are encountered daily by professional aviators.

INCREASING FLIGHT SIMULATOR EXPERIENCE

Encouraging the richer experience provided by simulators can be accomplished in several ways. Ideally it would be used all along a pilot's journey to become a professional aviator. Allowing credit for simulator training for each rating on the ladder to becoming a professional pilot would make high-quality simulator experience an implicit part of the development of commercial pilots. Another approach would be to allow credit for simulator hours in a larger aggregated amount at the last rung in the ladder, the 1,500 hours required to qualify as an airline first officer. Currently the FAA allows credit for a maximum of 100 hours, seven percent, of simulator training toward the requirement. Increasing the maximum amount of credit for simulator training to a larger portion of a pilot's flight experience would have a significant positive impact on the safety of our industry.

SOLVING THE AIRLINE PILOT SHORTAGE BY FULLY UTILIZING ADVANCEMENTS IN PILOT TRAINING

FSI believes a key long-term solution to the pilot shortage is better use of and greater credit for quality training provided by advanced training device and simulation technologies. To this end, the FAA must fully utilize the authority granted it in the Airline Safety Act of 2010 and provide credit towards the 1,500-flight hours required for an Airline Transport Pilot (ATP) certificate for time spent instructing or training in high-quality flight training and simulation devices. Congress and the FAA already recognize that not all hours in an aircraft have the same value or benefit. This recognition is manifest in the flight hour requirements for the three existing levels of a restricted Air Transport Pilot (R–ATP) rating: 750 hours (Military),

1,000 hours (4-year accredited aviation college program), 1,250 (2-year accredited program).

Expanded use of advanced training devices and simulation technology will significantly improve pilot training, reduce the cost and time required, and allow greater access to airline careers for a more diverse population of aspiring pilots. Most importantly, it will enhance the safety of the National Airspace System (NAS). Pilots will be better trained as the result of greater exposure to challenging conditions, multi-crew environments, and busy airline and airspace scenarios. These are all situations they do not face while accruing hours towards the 1,500-flight hours flying solo in a small aircraft. But pilots will be able to experience these situations virtually in advanced flight training devices and simulators if the limit on allowable flight training simulator hours was increased. In addition, training performed in advanced flight training devices allows both students and instructors to review their performance and repeat it as needed. Students can learn from their mistakes in a safe, but realistic and challenging environment.

CONCLUSION

The commercial aviation industry would be measurably strengthened by the increased use of flight training devices and full flight simulators, particularly those certified to the highest fidelity levels (see pictures on the next page; including pictures showing a cockpit in a simulator versus a cockpit in a small aircraft typically used for accruing the flight training hours.) Training in these devices is much richer and more valuable than training in an aircraft. This is because it gives pilots the ability to experience malfunctions and flight situations, such as icing and cross winds, that are simply impossible to experience safely in an aircraft. Increasing the amount of flight hour credit given to pilots for time spent instructing or training in flight training devices and full flight simulators would be very powerful both in improving aviation safety and in encouraging this method of high quality, broad-based, and effective virtual learning.

As a U.S. company with over seven decades of experience training pilots and expertise in simulation technology, the Subcommittee should consider FSI a resource as it develops solutions to the pilot and aviation workforce shortages for inclusion in the 2023 Federal Aviation Administration (FAA) Reauthorization.

Thank you for the opportunity to testify today.

Full Flight Simulators


Simulator Interior


Single Engine Piston Cockpit

Mr. YAKYM. Thank you, Mr. Thress. Ms. Krause, you are recognized for 5 minutes.

TESTIMONY OF HEATHER KRAUSE, DIRECTOR, PHYSICAL INFRASTRUCTURE, U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Ms. KRAUSE. Vice Chair Yakym, Ranking Member Cohen, and members of the subcommittee, thank you for the opportunity to discuss GAO's work on the aviation workforce. Like many other critical sectors of the Nation's economy, the aviation industry has been adversely affected by the COVID pandemic.

However, demand has steadily rebounded since spring of 2021 with ICAO predicting global traffic levels to exceed pre-pandemic levels this year. We have previously reported on industry concerns that new workers, particularly commercial airline pilots and aircraft mechanics, were not entering the industry at a pace sufficient

to replace attrition and support the industry's projected growth. With the recent rebound in traffic, these concerns have reemerged.

My statement today is based on our past work and forthcoming report on the aviation workforce and will focus on: One, what Federal and industry data reveal about the supply and demand of airline pilots and aircraft mechanics; two, challenges to maintaining or growing workforce supply; and, three, actions the aviation industry and FAA are taking to address those challenges.

First, Federal and industry data on the supply of U.S. pilots reveal a growing but also aging workforce. From 2017 through 2022, the total number of individuals qualified to be airplane pilots, that is, those holding airline transport pilot or ATP and active medical certificates increased by 3,000 or by 2 percent. The number of students enrolled in 4-year pilot training schools also doubled from around 15,000 in 2017 to around 30,000 in 2021. However, as of 2022, over half of active ATP certificate holders were over the age of 50.

While the supply has increased, the combination of increases in pilot hiring, wages, and employment in recent years also show strong demand and can serve as indicators of a tight labor market. Demand for pilots is especially acute among regional airlines reporting that their operations have been affected by difficulties in hiring and retaining pilots, particularly captains, who have moved to larger airlines.

As for aircraft mechanics, mechanic certificates grew by 11 percent, and student enrollment grew by 18 percent from 2017 through 2022. However, there was a decline in employment levels and an increase in wages, which may suggest that the number of mechanics willing or able to work in aviation has decreased.

There are some limitations to what data can tell us about this workforce. For example, because some certificated pilots and mechanics may be working for other industries or aerospace companies, the ATP and mechanic certificate data overestimate the number currently employed by airlines or repair stations. In addition, future supply and demand protections are inherently uncertain.

For example, the projected growth assumes continued economic growth. If a recession or another unexpected event affecting demand were to occur, the projections may be higher than actual demand.

A number of challenges continue to constrain the supply of pilots and mechanics according to aviation stakeholders we interviewed for our forthcoming report. Several of these challenges we have reported on before and include: One, the high cost of pilot education; two, pay and working conditions faced by mechanics whose skills are highly valued by other industries; and three, limited workforce diversity, which shrinks the pool of potential future applicants.

Airlines, repair stations, and FAA are taking steps to address these challenges. For example, several regional airlines recently increased pilot pay; in one case, boosting starting wages for first-year, first-class officers and captains by around 120 percent and 175 percent, respectively. In addition, some airlines and repair stations have established their own training schools and programs to help train pilots and mechanics.

FAA also has several efforts to enhance outreach and attract more youth and diversity to aviation careers. For example, under the Aviation Workforce Development Grant program established by Congress in FAA's last reauthorization, FAA awarded $5 million to 16 schools for pilots, and another $5 million to 15 schools for maintenance workers in 2022. However, FAA received more than 300 applications for these grants. And several stakeholders we interviewed said the funding provided is likely not enough to make a substantial impact on supply challenges.

In closing, a sufficient supply of skilled aviation workers is critical to ensuring a safe and robust aviation system. The recent strong recovery of aviation demand has been good for the industry. It has also exacerbated longstanding workforce challenges. Meeting aviation workforce needs is a shared responsibility among the aviation industry, schools, and Government. This concludes my statement. I look forward to answering your questions.

[Ms. Krause's prepared statement follows:]

Prepared Statement of Heather Krause, Director, Physical Infrastructure, U.S. Government Accountability Office

AVIATION WORKFORCE: SUPPLY OF AIRLINE PILOTS AND AIRCRAFT MECHANICS

Chairman Graves, Ranking Member Cohen and Members of the Subcommittee:

I am pleased to be here today to discuss the supply of and demand for commercial airline pilots and aircraft mechanics and industry and Federal Aviation Administration (FAA) responses to workforce supply challenges. The U.S. civil aviation workforce is responsible for helping move over half a billion people and millions of tons of goods each year. Like many other critical sectors of the nation's economy, the aviation industry has been adversely affected by the COVID–19 pandemic. Passenger demand for air travel plummeted in 2020, creating cascading effects across sectors including airlines, airports, and repair stations. However, passenger demand has steadily rebounded since spring 2021. In 2023, traffic levels in North America are expected to exceed pre-pandemic traffic levels, according to a March 2022 forecast from the International Air Transport Association.

As a result, industry questions about whether it has a sufficient number of workers to meet demand have reemerged. Industry's demand for pilots and mechanics is driven by several factors, including projected demand for air travel, the number of aircraft that airlines expect to use to fulfill that demand, as well as anticipated workforce attrition and retirements. We have previously reported on airlines' concerns that new workers—particularly commercial airline pilots and aircraft mechanics—are not entering the industry at a pace sufficient to replace attrition and retirements and support both the industry's projected growth and expansion into electrified aviation operations that may enter service in the next 5 years.[1] The aviation industry's response to the COVID–19 pandemic may have exacerbated these concerns, as airlines and other businesses encouraged workers to retire or voluntarily separate to reduce costs during the industry downturn.[2]

My statement today will highlight (1) what is known about the supply of and demand for commercial airline pilots and aircraft mechanics, and what is projected for

[1] GAO, *Aviation Workforce: Current and Future Availability of Airline Pilots*, GAO–14–232 (Washington, D.C.: Feb. 28, 2014); *Current and Future Availability of Aviation Engineering and Maintenance Professionals*, GAO–14–237 (Washington D.C.: Feb. 28, 2014); and *Transforming Aviation: Stakeholders Identified Issues to Address for 'Advanced Air Mobility'*, GAO–22–105020 (Washington, D.C.: May 9, 2022).

[2] Among other assistance, federal COVID–19 relief laws provided up to $63 billion in financial assistance for passenger airlines and other eligible applicants to pay employee wages, salaries, and benefits. The financial assistance, depending on the program, required recipients to refrain from conducting involuntary furloughs, among other requirements. For example, recipients were to use financial assistance from the three rounds of the Payroll Support Program (PSP) exclusively for the continuation of wages, salaries, and benefits. Recipients were required to refrain from conducting involuntary furloughs or terminations and reducing pay rates and benefits for prescribed periods of time.

the future; (2) challenges related to increasing the supply of pilots and mechanics, according to industry stakeholders; and (3) actions the aviation industry and FAA have taken to address workforce supply concerns.

This testimony is based on our body of work on aviation workforce issues.[3] In particular, we are drawing from a draft report being developed in response to a provision in the FAA Reauthorization Act of 2018 that GAO study the aviation and aerospace workforce of the future. The draft report is currently out for comment with the Department of Transportation (DOT) and FAA. We expect to issue the report next month. In addition, in May 2022, we reported on issues that industry and the federal government will need to address before an emerging form of air transportation—Advanced Air Mobility (AAM)—can be widely implemented, including challenges to developing a skilled AAM industry workforce.[4]

For the draft report, we examined industry and government data on airline pilots and aircraft mechanics. These data included the number of airline transport pilot and mechanic certificates FAA estimated to be active from 2017 through 2022, students enrolled in training programs, and hiring, wage, and employment data for these occupations. We determined the data were sufficiently reliable by conducting selected manual and electronic tests of the data. We also interviewed a range of aviation stakeholders, including representatives from domestic passenger and regional airlines; repair station operators that perform inspections and maintenance on aircraft; faculty from collegiate aviation schools and aviation maintenance schools; and multiple industry associations and labor groups representing a cross-section of aviation interests. The results of these interviews are not generalizable to the entire commercial aviation industry.

We also held two discussion groups with a non-generalizable selection of currently-employed aircraft mechanics, identified with labor union assistance, in which we discussed their perspectives on their careers to that point, including what factors attracted them to aviation careers and what obstacles they have faced. We also interviewed FAA program officials with subject matter expertise in areas such as pilot and mechanic certification and education and outreach programs, and reviewed relevant FAA documentation including grant project applications and rulemaking documents. More detailed information on our scope and methodology for this work can be found in the report we are issuing next month.

Similarly, our work on AAM workforce issues included interviews with a non-generalizable sample of 36 stakeholders including AAM companies, trade organizations, standards bodies, colleges and universities, state and local governments, and organizations that represent aerospace workers on these issues, among other methods.

More detailed information on our objectives, scope, and methodology for that work can be found in the issued report. The work on which this testimony is based is being conducted in accordance with generally accepted government auditing standards.

Available Data on the Supply of and Demand for Airline Pilots and Aircraft Mechanics

Pilot Supply Has Grown Since 2017 and Is Projected to Increase over the Next Two Decades

In our draft report, we determined that pilot supply grew from 2017 through 2022 based on FAA's Airline Transport Pilot (ATP) certification data and collegiate aviation student enrollment data.[5] Pilot supply may further increase over the next two decades based on projected growth in ATP certifications. However, the extent to which this projected supply would exceed or fall short of industry's demand for pi-

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[3] See GAO, *Aviation Workforce: Current and Future Availability of Airline Pilots*, GAO–14–232 (Washington, D.C.: Feb. 28, 2014); *Current and Future Availability of Aviation Engineering and Maintenance Professionals*, GAO–14–237 (Washington D.C.: Feb. 28, 2014); *Collegiate Aviation Schools: Stakeholders' Views on Challenges for Initial Pilot Training*, GAO–18–403 (Washington, D.C.: May 15, 2018); *Aviation Maintenance: Additional Coordination and Data Could Advance FAA Efforts to Promote a Robust, Diverse Workforce*, GAO–20–206 (Washington, D.C.: Feb. 6, 2020); and *Transforming Aviation: Stakeholders Identified Issues to Address for 'Advanced Air Mobility'*, GAO–22–105020 (Washington, D.C.: May 9, 2022).

[4] Advanced Air Mobility is expected to use revolutionary aircraft—which may feature electrified propulsion systems, increased levels of automation, and vertical take-off and landing capabilities—to transport people and cargo.

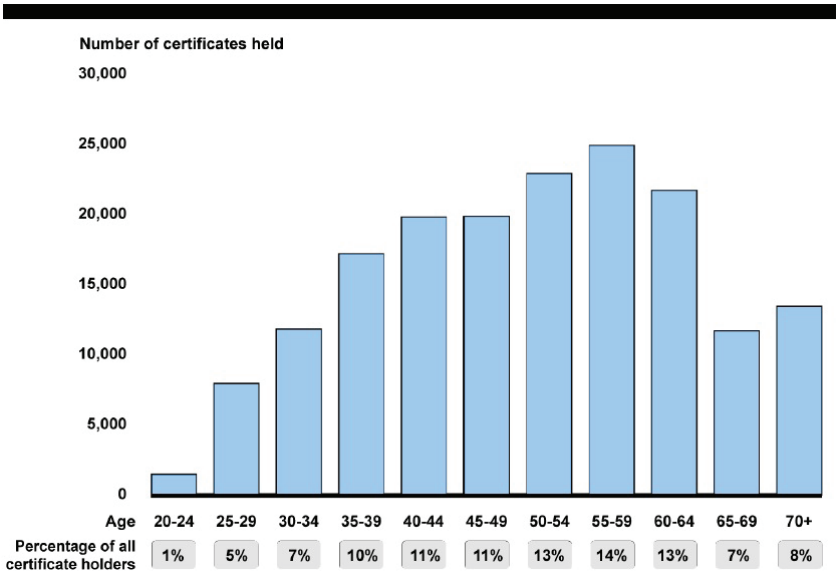
[5] Other sources of airline pilot supply include non-collegiate vocational pilot schools, non-collegiate, instructor-based pilot schools, and the military; however, these sources were outside the scope of our audit work.

lots is unknown given the uncertainties surrounding future demand, among other things.[6]

- *ATP certifications*: From 2017–2022, the supply of individuals qualified to be airline pilots—those under 65 years old and holding both an ATP certificate and an active medical certificate—increased by about 3,000 (or 2 percent, from 144,557 to 147,934 certificates), according to FAA data. The number of new ATP certifications issued each year by FAA grew more than 100 percent during this time period (from 4,449 to 9,588 certificates).[7]
- *Student enrollments*: The number of individuals enrolled in 4-year pilot training schools almost doubled from 2017 through 2021, from 15,329 to 30,088 students, according to data obtained from the University Aviation Association.[8]
- *Upcoming retirements*: According to FAA data, the average pilot age has remained at roughly 51 years old from 2017 through 2022. About 15 percent of all ATP certificate holders (25,214 of about 173,000) were 65—the mandatory retirement age for U.S. passenger airlines—or older in 2022 (see fig. 1).[9]

According to FAA data, an average of about 4,300 ATP holders under 65 will reach mandatory retirement age each year from 2022 through 2042. Approximately 15 percent of current ATP certificate holders will turn 65 by 2027, 32 percent by 2032, 47 percent by 2037, and 61 percent by 2042. Other factors, such as early retirements or pilots leaving the aviation industry could further reduce pilot supply; however, these data are not publicly available.

Figure 1: Distribution of Active Airline Transport Pilot Certificates in 2022 by Age Group



Source: GAO analysis of FAA information. GAO–23–106769

Note: Pilots age 65 and over are no longer eligible for employment with scheduled U.S. passenger airlines, but could work as pilots or instructors elsewhere.

[6] We have long reported that the demand for air travel is highly cyclical in relation to the state of the economy, as well as to political, international, and health-related events. See GAO, *Commercial Aviation: Airline Industry Contraction Due to Volatile Fuel Prices and Falling Demand Affects Airports, Passengers, and Federal Government Revenues*, GAO–09–393 (Washington, D.C.: Apr. 21, 2009).

[7] The pool of ATP certificate holders may include pilots who are unavailable for work, not suitable or competent to act as pilots in airline operations, or unwilling to work at wages being offered.

[8] At the time of our analysis, 2022 enrollment data were not yet available.

[9] While pilots age 65 and over are no longer eligible to fly for scheduled U.S. passenger airlines, they may be eligible to work as pilots or instructors elsewhere.

- *Forecasted increase in pilot supply*: Based on FAA's forecast of ATP certificate growth, which, according to FAA officials, factors in mandatory retirements, the number of ATP certificate holders under 65 may increase 10–17 percent from 2022 through 2042. To project the growth of ATP certificate holders who are under 65, according to FAA officials, an annual growth rate between 0.5 and 0.8 percent could be applied to the pool of certificate holders. Using those lower and upper bounds, the pool of certificate holders could grow from 147,934 in 2022 to either 163,452 (10 percent growth) or as many as 173,492 (17 percent growth) ATP certificate holders in 2042. However, the extent to which the projected supply would exceed or fall short of industry's demand for pilots is unknown given the uncertainties surrounding future demand.[10]

Current Demand for Pilots is Strong

Publicly available data on hiring and employment by U.S. passenger airlines—and the interaction of hiring and employment with wages—indicate there is strong demand for pilots, as noted in our draft report.

- *Hiring*: Pilot hiring, one of the key measures of demand for airline pilots, recovered strongly in 2021 following a steep drop after the onset of the pandemic. According to data from Future and Active Pilot Advisors (FAPA), nine mainline U.S. airlines hired 28,418 pilots from 2017 through 2022—an average of almost 4,700 pilots per year.[11] However, that growth was not evenly distributed across that time period. For example, in 2020 those nine airlines collectively hired about 1,500 pilots, coinciding with the steep drop in demand for air travel early in the pandemic. In 2021, the nine airlines hired 4,067 pilots, and in 2022 hired 11,194 pilots, according to FAPA data.

It is not possible to determine from the FAPA data to what extent those nine airlines hired pilots who were new or returning to the labor force, as opposed to pilots who were employed by other airlines. However, representatives from two regional airlines told us as part of our ongoing work that they have lost pilots to hiring by larger airlines in recent years.

- *Employment*: According to the latest available full-year data reported by airlines to DOT, the number of pilots employed by 22 mainline and regional airlines increased from 70,747 in 2017 to more than 73,000 in 2021. The 2021 employment numbers mark a turnaround from 2020, when pilot employment at those airlines dropped by almost 9 percent compared to 2019, as many pilots retired, were furloughed, or left the profession, at least temporarily. However, the 2021 employment numbers remain below 2018 levels.[12]
- *Pay*: Mainline and regional airline first officer pay rose from 2017 through 2021, according to our analysis of data from the Air Line Pilots Association. At 10 mainline airlines, starting pay for a first officer in their first year rose from an average of about $62 per hour in 2017 to almost $76 per hour in 2021, an annualized rate of 5.3 percent.[13] At 12 regional airlines, first-year, hourly pay for a first officer rose from an average of $35 an hour in 2017 to almost$45 an hour in 2021, an annualized rate of about 6 percent.[14]

In addition, demand for pilots is especially acute among regional airlines, which have lost pilots to other employers, according to representatives from regional airlines. For example, in July 2022, representatives from a regional airline told us they have lost about 100 pilots a month to larger airlines. One regional airline estimated

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[10] We have long reported that the demand for air travel is highly cyclical in relation to the state of the economy, as well as to political, international, and health-related events. See GAO, *Commercial Aviation: Airline Industry Contraction Due to Volatile Fuel Prices and Falling Demand Affects Airports, Passengers, and Federal Government Revenues*, GAO–09–393 (Washington, D.C.: Apr. 21, 2009).

[11] FAA defines mainline airlines as those providing service primarily via aircraft with 90 or more seats. See FAA, *FAA Aerospace Forecast Fiscal Years 2022–2042*. The nine mainline U.S. passenger airlines for which FAPA makes pilot hiring data publicly available are Alaska Airlines, Allegiant Air, American Airlines, Delta Air Lines, Frontier Airlines, Hawaiian Airlines, Southwest Airlines, Spirit Airlines, and United Airlines.

[12] According to U.S. Bureau of Labor Statistics (BLS) data, employment of the aircraft pilots and flight engineers occupational group increased by about 0.7 percent per year from 2017–2021. In comparison, employment across all occupations increased by about 0.2 percent each year according to BLS.

[13] In real 2021 dollars, pay rose from about $68 per hour in 2017 to $76 per hour in 2021, an annualized rate of 2.7 percent per year. We adjusted pay for inflation in real 2021 dollars using the Consumer Price Index from the U.S. Department of Labor, Bureau of Labor Statistics.

[14] In real 2021 dollars, pay rose from about $39 an hour in 2017 to about $44 an hour in 2021, an annualized rate of 3 percent per year. We adjusted pay for inflation in real 2021 dollars using the Consumer Price Index for the U.S. Department of Labor, Bureau of Labor Statistics.

that U.S. regional airlines would collectively lose about 11,000 pilots—or 65 percent of their workforce—to larger airlines in 2022. Representatives from three regional airlines told us they typically lose more experienced captains to mainline airlines, which makes it challenging for regional airlines to have enough captains to develop their less experienced first officers. In 2018, we also reported that regional airlines indicated difficulties finding sufficient numbers of qualified pilots to meet demand.[15]

The federal government and the aviation industry forecast that demand for pilots will continue to be strong in the future. For example, the Bureau of Labor Statistics (BLS) projects an average of about 18,000 job openings annually for the aircraft pilots and flight engineers occupational group until 2031.[16] While these forecasts are helpful in gaining a sense of aviation workforce demand in the years to come, developing forecasts is inherently difficult, as they are based on numerous assumptions and actual demand might differ from projected demand due to a variety of factors. For example, the projections assume continued economic growth, but if a recession or another unexpected event like the COVID–19 pandemic were to occur, the projections of workforce demand are likely to be higher than actual demand.

The Number of Individuals with Aircraft Mechanic Certificates Increased, but Stakeholders Noted Challenges to Hiring

In our draft report, we determined that aircraft mechanic supply grew from 2017 through 2022 based on mechanic certification and aviation maintenance student enrollment data.

- *New mechanic certificates*: The number of newly issued mechanic certificates increased 11 percent from 2017 through 2022 (6,398 to 7,119 certificates), an annualized growth rate of about 2 percent.
- *All mechanic certificates*: The total pool of mechanic certificates also increased 12 percent from 2017 through 2022, from 286,268 to 320,042, an annualized growth rate of about 2 percent per year. However, these data provide limited information on the current mechanic workforce, as the number of mechanics who have retired from, or otherwise left, the aviation industry since 2017 is unknown. Additionally, as we reported in 2020, individuals holding mechanic certificates might never work in the aviation industry, or might begin their career in the aviation industry and leave for a job in another industry.[17]
- *Student enrollments*: According to survey data compiled by the Aviation Technician Education Council, estimated enrollment at aviation maintenance technician schools rose from 17,791 students in 2017 to roughly 21,000 students in 2021. However, representatives we spoke with from two maintenance schools indicated that their enrollments have either remained fairly steady or decreased in recent years. For example, representatives from one school told us they had a waiting list for enrollment before the pandemic, but now are unable to fill all of their available seats.

Available data provide a limited picture of the current demand for aircraft mechanics, as noted in our draft report. Hiring data from repair stations and other aviation industry employers are not publicly available, which limits visibility into the extent to which employers are trying and able to fill vacancies. Data reported to DOT by airlines indicate that employment of maintenance labor (a category which includes more than aircraft mechanics) at 22 mainline and regional airlines decreased by about 13 percent from 2017 through 2021; however, average annual pay increased by about 12 percent over this period.[18] Although other factors may be involved, the decline in airline employment coupled with an increase in wages suggest that there could be a decrease in the number of mechanics willing and able to work for airlines, due to retirements or to individuals finding employment elsewhere.

Interviews we conducted for our draft report also identified recent challenges in meeting current aircraft mechanic workforce needs. Specifically, representatives from four airlines, three repair stations, and a labor union told us that aviation businesses have experienced challenges maintaining a sufficient number of mechanics. Representatives from two of the repair stations told us that inadequate staffing

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[15] GAO–18–403.

[16] The aircraft pilots and flight engineers occupational group includes commercial passenger and cargo airline pilots, charter pilots, flight instructors, and helicopter pilots, among other occupations.

[17] GAO–20–206.

[18] DOT's "Maintenance Labor" category includes apprentice mechanics, carpenters, chief mechanics, cleaners, crew chiefs, electricians, engineers, foremen, inspectors, lead mechanics, mechanics, mechanic helpers, non-productive shop labor, and shop labor not identified with specific maintenance projects.

levels have contributed to backlogs in work and delays in maintenance activities. Representatives from one regional airline reported that it was 5 to 7 percent below its desired staffing level in April 2022, while representatives from another regional airline reported that their attrition has outpaced new hires over the prior 12 months.

Similar to the pilot demand forecasts, the federal government and the aviation industry forecast that demand for aviation maintenance workers—including aircraft mechanics—may be strong in the future. For example, BLS projects an average of about 11,500 job openings annually for the aircraft mechanics and service technicians occupational group from 2021 until 2031.[19] However, according to one consulting firm's forecast for 2022 through 2032, aviation maintenance supply challenges in North America could limit the number of aircraft in service to meet passenger demand.[20]

Ongoing Challenges to Increasing the Supply of Pilots and Aircraft Mechanics

Aviation industry stakeholders we interviewed as part of our draft report identified a number of challenges to increasing pilot and mechanic supply, several of which we have previously reported. Our forthcoming report will provide more details on the challenges noted here as well as others affecting the available supply of pilots and mechanics. In addition, these challenges may be exacerbated by the additional demand for workers to support new types of aviation operations—such as AAM.

- *Pilot education costs*: Affordability is an important factor affecting the potential pool of applicants for pilots and other aerospace professions. For example, according to data from the University Aviation Association, the average cost of a 4-year degree plus flight training "lab fees" in 2021 was $85,745 for in-state students and $138,511 for out-of-state students. The full cost of a collegiate flight education exceeds the maximum amount of certain types of federal financial aid available to eligible students. Some aviation industry stakeholders we interviewed for our May 2022 report characterized the high costs of training as a barrier to entry for students who are not from affluent backgrounds, and stated that some potential students choose not to pursue aerospace education because of these high costs.[21]
- *ATP certification requirements*: Stakeholders hold differing views on FAA's 1,500-flight-hour requirement to be hired as a first officer and its effect on pilot supply.[22] Representatives from regional airlines we spoke with characterized the requirement as a barrier to entry that has played a part in constraining the pilot labor pool and contributed to current pilot supply challenges. However, the Air Line Pilots Association (ALPA) stated that the 1,500-flight-hour requirement has contributed to enhanced aviation safety and attributes the pilot supply challenges that airlines have recently experienced to their decisions to implement workforce reductions during the COVID–19 pandemic. ALPA has also stated that, based on the pool of ATP certificate holders, there is more than sufficient availability of qualified pilots to fly for airlines given the right opportunity. Additionally, faculty from three collegiate aviation programs told us that the 1,500-hour requirement has helped schools retain flight instructors longer because their time instructing students counts toward the 1,500 hours. However, many pilot training facilities included in our May 2022 report reported being overstretched due to a lack of flight instructors, among other challenges.[23]
- *Infrastructure constraints*: Faculty we interviewed from two collegiate aviation programs indicated that their ability to produce more pilots is constrained by existing school infrastructure, including facilities and aircraft to train students.

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[19] The aircraft mechanics and service technicians occupational group includes occupations such as aircraft engine specialists, airframe mechanics, flight test mechanics, and helicopter engine mechanics.

[20] Oliver Wyman, *Global Fleet and MRO Market Forecast 2022–2032*. MRO is an acronym that stands for maintenance, repair, and overhaul organizations.

[21] GAO–22–105020.

[22] Pursuant to a statutory requirement, in July 2013, FAA began requiring all first officers to have an ATP certificate, which requires 1,500 hours of flight experience. Pub. L. No. 111–216, § 217(c)(1) 124 Stat. 2348, 2367. Pilots with fewer than 1,500 hours can obtain a "restricted-privileges" ATP certificate (R–ATP), under which specific academic training courses or military experience can reduce the required hours of total flight time to fly certain operations. FAA made this change for airline first officers following the 2009 Colgan Air Inc. crash in New York, and subsequent legislation that required FAA to modify, among other things, first officer qualifications.

[23] GAO–22–105020.

For example, faculty from one school told us that limited classroom space, among other infrastructure constraints, has hampered its ability to take on additional enrollments. The school is planning a new building to house the aviation program's administration as well as provide additional classrooms. Additionally, some stakeholders said current aerospace training facilities may not be able to produce sufficient numbers of workers to handle demand from both the traditional aerospace sector and the emerging AAM industry.[24]

- *Pay and working conditions*: According to FAA officials we interviewed for our draft report, mechanics are often underpaid, given the responsibilities they have for ensuring the safety and airworthiness of an aircraft. Additionally, several participants in our mechanic discussion groups described challenging working conditions, including the likelihood of working the overnight graveyard shift early in one's career, working outside in inclement weather, and regular exposure to noise and chemicals.
- *Competition for talent from other industries*: According to several aviation stakeholders, the set of skills mechanics acquire from maintenance schools is valued by other industries, which may offer more attractive compensation or work environments than the aviation industry.
- *Limited awareness and stigma of aviation maintenance careers*: Several aviation industry stakeholders told us that interest in aircraft mechanic and other aviation maintenance careers suffers from a lack of public awareness of the career opportunities. According to FAA officials, mechanics are not as visible to the public as other careers in the aviation industry. According to representatives from one regional airline, support mechanisms for promoting aviation maintenance professions—such as engagement with high schools and maintenance schools, promotional marketing, and recruitment—are not as well developed as those supporting and promoting the airline pilot profession.

In addition, stakeholders we interviewed for our draft report, along with an aviation industry workforce study, cited limited workforce diversity as a challenge to increasing both pilot and mechanic supply. For example, in May 2022 we reported that some stakeholders viewed the industry as failing to cultivate a more diverse workforce, which in turn has factored into hiring shortfalls across the aerospace industry. These stakeholders said the aerospace industry has not traditionally done a good job of engaging students from diverse backgrounds and has also struggled retaining them once hired. These stakeholders cited a variety of reasons, including a lack of attention to the issue.[25]

Data and studies also show limited diversity among pilots and mechanics. Although women represented 47 percent of the total U.S. workforce in 2021, an aviation industry workforce study showed that women comprised 5 percent of Air Line Pilots Association member pilots and 3.6 percent of association member captains in 2021.[26] The study also noted that racial and ethnic groups including Black or African American, Asian, and Hispanic or Latino persons are underrepresented in these careers. For example, representatives from a non-profit pilot association told us that 3 to 5 percent of the pilot workforce are Latino. Additionally, University Aviation Association data on pilot students in 4-year schools indicate that 17 and 29 percent of the 30,088 enrolled students in 2021 identify as female or minority, respectively. Women make up 2.6 percent of the aviation maintenance workforce, according to the aviation industry workforce study.

While these non-governmental data offer some insight into the diversity of the workforce, we and others have identified opportunities for FAA to address aviation maintenance workforce challenges through its use of relevant data. In February 2020, we recommended that FAA use its existing data—which includes demographic information for mechanic certificate holders, such as gender—and coordinate with other federal agencies to identify and gather information needed to measure progress and target resources toward diversifying the talent pool for aviation maintenance careers.[27] As of April 2023, this recommendation remains open.

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[24] GAO–22–105020.
[25] GAO–22–105020.
[26] Rebecca Lutte, *Women in Aviation: A Workforce Report, 2021 Edition* (Omaha, Nebraska: The University of Nebraska at Omaha Aviation Institute, December 2021).
[27] GAO–20–206.

AVIATION BUSINESSES AND FAA ACTIONS TO ADDRESS WORKFORCE SUPPLY CONCERNS

Our draft report identifies a number of actions U.S. airlines and repair stations are taking to help bolster the supply of pilots, including the following illustrative examples.

- *Offering higher pay and bonuses*: Certain regional airlines have raised pay substantially to respond to increased pilot attrition to mainline airlines. For example, in August 2022, CommuteAir, a regional airline that is partially owned by United Airlines, announced that it is increasing starting pay for first officers from $51 an hour to $72 an hour, and for captains from $84 per hour to $100 per hour. Mesa Airlines also announced in August 2022 that it would begin offering starting wages of $100 an hour for first-year first officers, and $150 an hour for first-year captains, increases of 118 percent and 172 percent, respectively. Regional airlines are also offering signing bonuses, captain upgrade bonuses, and retention bonuses.

Mainline airlines have also increased pilot pay. For example, in October 2022, Alaska Airlines announced that it had ratified an agreement with the Air Line Pilots Association that offers pilot pay increases ranging from 8 percent to 23 percent, based on seniority. By 2024, captains will be earning $300 to $330 per hour and first officers $108 to $228 per hour, depending on years of service.

According to several sources, employers have modestly increased mechanic wages in the last 2 years, but consumer price inflation may have counteracted more recent pay increases. According to a 2022 industry report, the hourly wage for an entry-level certificated mechanic rose from $21.54 in 2020 to $25.49 in 2022, a nearly 20 percent increase.[28] Additionally, officials from two repair stations we interviewed told us they had increased their wages for entry-level mechanics.

- *Recruiting foreign pilots*: According to FAA data, the number of foreign-licensed pilots seeking ATP certificates remained steady from 2017–2020 before increasing 191 percent from 2020 through 2022. However, foreign pilots remain a small portion of the pilot workforce. Several regional and low-cost U.S. airlines—including Breeze Airways, SkyWest Airlines, ExpressJet Airlines, CommuteAir, Spirit Airlines, and Frontier Airlines—have recruited and hired Australian pilots to address workforce concerns during the pandemic recovery.
- *Developing training schools and programs*: Airlines, including United Airlines (Aviate Academy) and Republic Airways (LIFT Academy), launched flight schools in recent years to directly train their pilots and supplement their hiring pipelines. In addition, some airlines and repair stations use pathway programs with maintenance schools and universities to attract and retain entry-level mechanics, offer them employment upon graduation, and advance them throughout their career. To attract entry-level maintenance workers, two of the three repair stations we interviewed indicated that they had recently established apprenticeship programs, in which employers hire workers without, or with limited, aviation maintenance experience and provide on-the-job training to prepare them to pass the FAA certification tests. These programs often provide a condition of employment once apprentices have achieved their certification.

As described in our draft report, FAA has also undertaken several efforts to enhance aviation educational outreach and to attract more youth and greater diversity to aviation careers. For example, in response to mandates in the 2018 FAA reauthorization, FAA has established two organizational bodies that have undertaken studies and developed reports and recommendations to encourage youth and women's involvement in aviation careers.[29] These reports direct recommendations to Congress, FAA, and the aviation industry. According to officials, FAA is determining how the recommendations from these efforts could be implemented. The agency also plans to provide updates annually on the status of those recommendations for each effort on FAA's webpage.

In addition, FAA is awarding grants to programs geared toward attracting young people to aviation careers. The Aviation Workforce Development Grant Program was mandated by section 625 of the 2018 FAA reauthorization and is aimed at investing in the aviation workforce by helping to support the education and recruitment of

[28] Aviation Technician Education Council, *2022 Pipeline Report*.

[29] In addition to responding to mandates in sections 602 and 612 of the 2018 reauthorization by establishing the Youth Access to American Jobs in Aviation Task Force and the Women in Aviation Advisory Board, FAA also wrote the Youth in Aviation Outreach Report summarizing its existing outreach efforts to students who are interested in science, technology, engineering, and math (STEM) careers, as required in Section 601 of the FAA Reauthorization Act of 2018. Pub. L. No.115–254, 132 Stat. 3185, 3400.

the next generation of aviation professionals. The law established separate grant programs for pilots and aviation maintenance workers.[30] The law also outlined dollar amount limits, eligibility requirements, and the authorization period for grant projects.[31]

In its initial round of funding in fiscal year 2022, FAA received more than 300 applications in total for the two programs. The agency awarded $5 million in funding to 16 recipients under the grant program for pilots. Additionally, FAA awarded $5 million to 15 recipients under the aviation maintenance grant program.[32] FAA announced $10 million in grant awards under the two programs in January 2022, and the period of performance for each recipient is 18 months, ending in July 2023. Upon project conclusion, recipients are required to submit grant closeout reports that document all progress and performance metrics.[33] FAA announced a second round of grant funding in April 2022, for which applications were accepted until June 2022.

Several stakeholders we interviewed for our draft report—including officials from a labor union, a repair station, and an airline—indicated support for the Aviation Workforce Development Grant Program.

However, these stakeholders expressed concerns about the amount of funding provided. For example, officials from one airline told us that the current funding provided for the program was likely not large enough to make a substantial impact.

Chairman Graves, Ranking Member Cohen, and Members of the Subcommittee, this completes my prepared remarks. I would be pleased to respond to any questions that you or other Members of the Subcommittee may have at this time.

Mr. YAKYM. Thank you, Ms. Krause. Captain Ambrosi, you are recognized for 5 minutes for your opening statement.

TESTIMONY OF CAPT. JASON AMBROSI, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

Mr. AMBROSI. Chair Graves, Ranking Member Larsen, Chair Graves, Ranking Member Cohen, and members of the subcommittee, thank you for the opportunity to offer my view on behalf of more than 67,000 pilots of the Air Line Pilots Association, International.

I would like to thank this committee for its bold action in 2020 to pass the Payroll Support Program. It prevented the collapse of the airline industry and saved American jobs. Your work guaranteed that this country would have enough pilots during the pandemic and could respond to demand-driven growth when recovery came. Thanks to you, the United States has more than enough pilots and the safest guys in the world.

A decade earlier, this committee also came together in a bipartisan effort to take on a crisis in our industry, a series of fatal accidents, the last of which occurred near Buffalo, New York, in 2009.

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[30] According to FAA, the intent of the grant program for pilots is to support meaningful education designed to help students become aircraft pilots, aerospace engineers, or drone operators. The intent of the aviation maintenance grant program is to expand the aviation maintenance workforce, establish education and apprenticeship opportunities, and support activities to facilitate the transition to careers in aviation maintenance, including members of the Armed Forces.

[31] According to section 625 of the FAA Reauthorization Act of 2018, each grant program is permitted to spend $5,000,000 each fiscal year, from 2019 to 2023. Each grant project is eligible to receive up to $500,000. The Aviation Workforce Development grant program has been authorized through fiscal year 2023.

[32] Eligible applicants include holders of a certificate issued under parts 21, 121, 135, or 145 of Title 14 C.F.R., or labor organizations representing aviation maintenance workers, accredited higher education or high schools, and state or local government entities.

[33] Recipients are required to submit several indicators semi-annually to allow FAA to track the performance of grant projects, including: (1) a detailed description of program activities and recruitment events; (2) the number of individuals who enrolled in the program; (3) the number of individuals who successfully completed the program; and (4) the number of participants who successfully completed application or certification requirements necessary to become a pilot or aviation maintenance technical worker.

I am honored that the families of those who lost loved ones on that flight and on the ground are represented here today.

In response to more than 1,100 lives lost in U.S. airline accidents in the 20 years prior to 2010, Congress heeded investigators who found that inadequate pilot experience and training had contributed to the crashes. In the 2010 FAA bill, you established stronger pilot qualification training and experience requirements and made other aviation safety improvements. Since then, passenger fatalities have dropped by 99.8 percent. This year's reauthorization should be based on retaining these provisions.

This pilot training framework has also produced tens of thousands more pilots over the past decade than airlines needed. The United States has certificated nearly 64,000 airline transport pilots since July of 2013, while airlines have hired to fill approximately 40,000 positions.

In this context, airlines' decisions during COVID to bump pilots to smaller equipment, park aircraft, as well as furlough and put pilots on inactive status, have created a training backlog. When demand and subsequently growth returned more quickly than some airlines anticipated, most of these pilots had to be retrained. Retraining is time-intensive and expensive. It also relies on a training footprint that includes personnel and simulator devices and wasn't designed for a global pandemic.

Fortunately, we have more pilots available now than before the pandemic. As a result, the training backlog is already resolving itself as airlines get caught up. Moreover, pilot training classes are at capacity and college aviation programs are full.

With the recovery and thanks to this committee's work, airlines are hiring pilots as companies expand marketshare and networks. As a result, new workers are performing new roles in an air transportation system that is already stressed and working to integrate new and expanding users. This is no time to weaken safety standards.

The current labor market is complicated by pilots moving among carriers as they leave airlines that offer less attractive careers for those providing better paying quality of life.

Regional airlines have traditionally offered second-tier paying work roles, and some would rather lower safety standards than pay pilots a living wage. This isn't how the United States became the gold standard in aviation safety, and it is predictable that pilots can pursue better opportunities.

Large passenger and cargo airlines have 7,500 more pilots today than before the pandemic, even when we account for pilots who change jobs multiple times. While encouraging, we shouldn't lose focus on continuing to expand the pilot pipeline.

In this year's FAA reauthorization, Congress should build on the strength of America's aviation workforce, maintain safety, and open the doors of opportunity for all those who aspire to fly by providing student loans for appropriate flight training programs, establishing grants to build flight training and education degree programs at minority-serving institutions, increasing funding for the Workforce Development Grant program, and making the Women in Aviation Advisory Board a permanent body.

At the same time, we need a real dialogue about our Nation's commitment to air service to small communities. I flew for a regional airline, and I am committed to ensuring that small and rural community passengers have access to safe and reliable service. However, under deregulation, airlines base service decisions on market demand.

ALPA stands ready to work with this committee to improve the Essential Air Service Program. We support increasing the subsidy cap, enabling the regulator and airlines to adjust EAS payments when appropriate, and modifying airlines' frequency requirements. Actions like these—not weakening safety standards—will provide the air service rural communities need.

ALPA looks forward to collaborating with this committee to ensure this Nation continues to have an abundant supply of airline pilots and lead the world in aviation safety. Thank you.

[Mr. Ambrosi's prepared statement follows:]

Prepared Statement of Capt. Jason Ambrosi, President, Air Line Pilots Association, International

On behalf of the Air Line Pilots Association, International (ALPA), I want to thank you for inviting me to testify on the current and future aerospace workforce. My name is Captain Jason Ambrosi and I am a current and qualified international captain on the Boeing 767 at Delta Air Lines, and serve as the president of ALPA. ALPA is the largest airline pilot union in the world, as well as the largest non-governmental aviation safety organization, with a history of safety advocacy spanning more than 90 years.

Thanks to the leadership of Chair Graves and Ranking Member Cohen and many others on the Committee, the Payroll Support Program and its strong worker protection and retention provisions provided a bridge to guarantee there are a sufficient number of pilots to not only ensure system operability throughout and after the pandemic, but also to accommodate demand-driven growth for air carriers today. In the absence of bold intervention to invest in and preserve pilots and other airline personnel, we likely would not be having this hearing today. Carrier capacity would be extremely limited, and *available* pilot personnel would be a major constraint on passenger and cargo operations.

A decade earlier, this Committee also came together, again in bipartisan fashion, to address another crisis in U.S. aviation: the unacceptably high number of airline passenger fatalities. In fact, in the two decades before Congress intervened to make life-saving changes to the law, more than 1,100 people were killed in Part 121 airline passenger operations. Since the passage of the 2010 Act, the United States has experienced a 99.8 percent reduction in airline passenger fatalities. So, I commend you for not only taking bold action to save tens of thousands of pilot jobs during the pandemic, but also for saving countless lives and establishing a framework for producing more pilots than the airline industry has needed over the past ten years.

Much has been written about the current and future supply of pilots in the United States, with frequently little to no substantiation of information, misleading data, or a failure to account for a multitude of industry dynamics at play. Here are the facts: there are more than enough pilots to meet U.S. airline hiring demand; airline pilot growth has increased each year since the pandemic; and airline decisions to leave communities are market-driven business choices and should not be conflated with pilot supply. Training capacity has been the dominant *pilot*-related constraint on air travel. The displacement of pilots by carriers to ease costs combined with post-pandemic carrier hiring growth has created considerable attrition and a significant training backlog. These are the pilot labor dynamics prevailing today. The good news is that the system is resilient—and is working to correct this current, short-term situation. All while maintaining the United States' enviable position of having the golden standard when it comes to the safety of our aviation system.

Responding to temporary post-COVID industry problems with permanent changes to pilot training and qualification requirements is ill-considered and dangerous. The lifesaving safety improvements ushered in by this Committee through the Airline Safety and Federal Aviation Administration Extension Act of 2010 and attendant

minimum first officer qualification rules is the framework by which the U.S. airline industry is safer than at any point in history. Attempts to undermine or otherwise alter or repeal this lifesaving set of requirements, including moving from an experiential-based training and qualification regime to a simulation-based system, threatens the lives of the traveling public and frontline aviation workers—and should be summarily rejected.

PILOT SUPPLY AND THE AIRLINE INDUSTRY

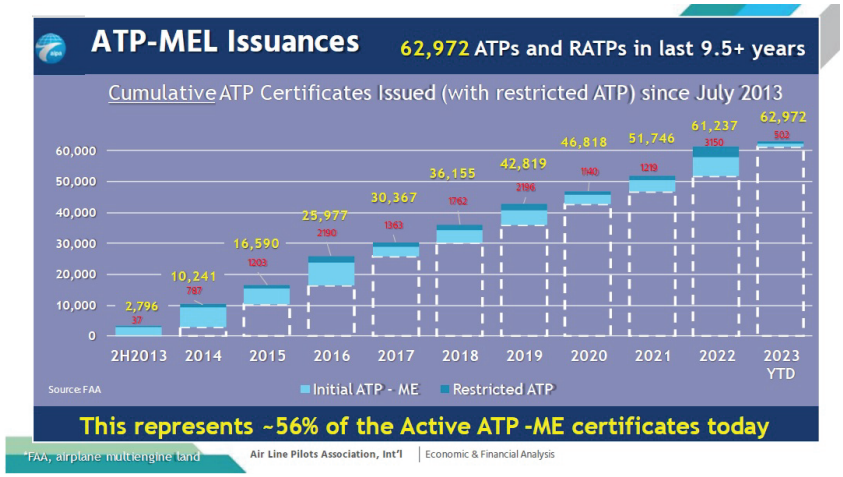
Over the last decade, segments of the industry have speciously suggested there is an issue with pilot supply in the United States. This narrative does not reflect reality. In fact, according to the only publicly available data on pilot head counts at U.S. air carriers, the nation has produ62,972 pilots, while ALPA estimates that airlines have hired approximately 40,000 between 2013 and today. And in a sign of just how strong the post-pandemic pilot pipeline has been, there are more than 7,500 net pilots today at the large passenger and cargo carriers than pre-pandemic. Again, there are more than enough airline pilots to meet demand and that is thanks, in large part, to the leadership of this Committee.

Airline	12/31/2019	12/31/2022	Difference
Delta	13,082	15,040	1,958
United	12,251	13,831	1,580
American	13,800	13,450	–350
Southwest	9,300	9,342	42
FedEx	5,028	5,912	884
JetBlue	3,661	4,314	653
UPS	2,800	3,500	700
Alaska	3,048	3,292	244
Spirit	2,390	3,184	794
Frontier	1,492	1,997	505
Allegiant	947	1,100	153
Hawaiian	869	1,012	143
Sun Country	368	571	203
Total	69,036	76,545	7,509

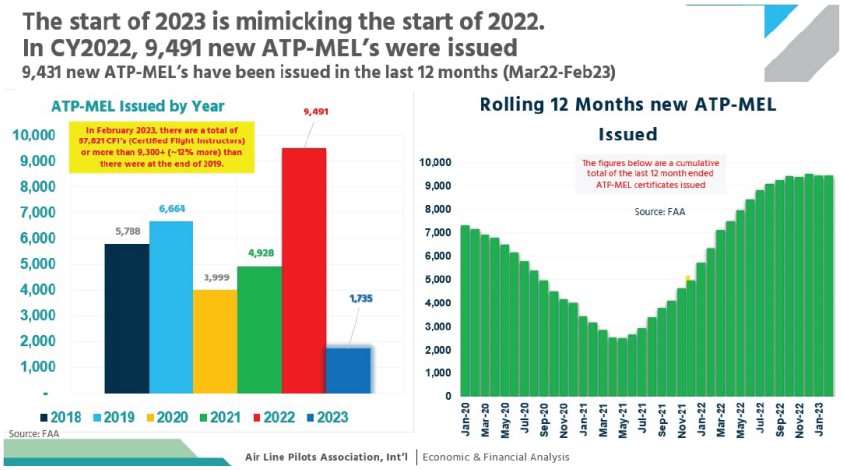
Pilot counts from airline annual reports; FedEx data from ALPA member data; 2019 Frontier data from ALPA member data

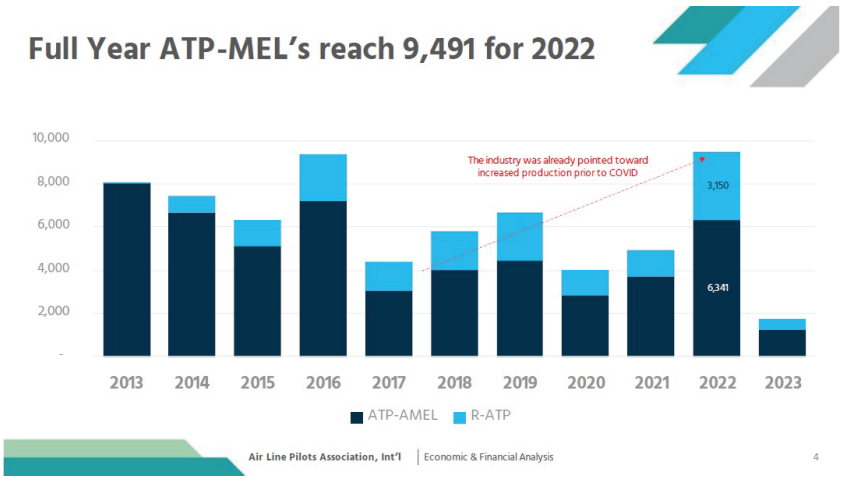
To most accurately quantify the number of pilots who can operate aircraft for FAR Part 121 air carriers (as opposed to all commercial pilots), it is necessary to examine the ATP multiengine rating (ATP–MEL) holders. The ATP–MEL is the required license that pilots flying for Part 121 major, low-cost, regional, and cargo airlines hold[1]. ATP–MEL pilots include both ATP and R–ATP pilots who can operate aircraft for these air carriers. The current production of ATP–MEL certificated pilots has outpaced U.S. airline hiring needs to replace retiring pilots and has also covered the new hiring demand created by flying increases before the pandemic and today. Specifically, over the last nine-and-a-half years for which there is data, the FAA has issued 62,972 certificates, while mainline airline carriers hired for approximately 40,000 pilot positions.

[1] This testimony will use "ATP–MEL" when discussing pilot supply and demand. This term covers ATP and Restricted-ATP certificate holders. ATP–MEL is the data series provided by the FAA for use by airline stakeholders, including Airlines for America (A4A), the Regional Airline Association (RAA), and ALPA. By using ATP–MEL, we ensure the removal of pilots with only single-engine licenses, which represent a fraction of ATP and R–ATP certificate holders. The data presented in this testimony therefore represents the most accurate statistical approximation of the pilot pool that can apply for and fly for FAR Part 121 air carriers.

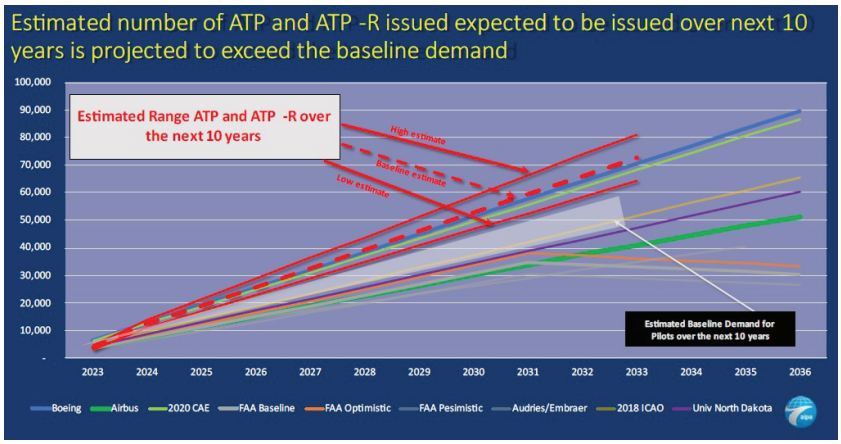


Looking at the certificates issued by year versus cumulatively, there has been an average of more than 6,200 new ATP and R–ATP certificates issued every year since 2014, and that figure has increased since airlines have announced additional hiring needs. For example, from March 2021 to February 2023 the FAA has issued 15,759 new ATP and R–ATP certificates (or an average of 657 per month). This also means that more than half of all active ATP and R–ATP certificate-holders under the age of 65 today received their FAA certification during the last nearly 10 years, signifying a younger cadre of new pilots who will remain in the industry for a long time. These numbers also reflect a demand for pilots to accommodate substantial growth in the airline industry year-over-year.





As we examine various data to use in the discussion about pilot availability, it's important to frame the context under which forecasts for pilot demand or independent reports about pilot supply are created and published. For example, Boeing releases an annual forecast on the global commercial market that includes pilot demand. This forecast, based on fixed growth assumptions, is useful for the manufacturer's purpose of selling aircraft, but has limited predictive value for the U.S. airlines and the pilot profession, which are subject to cyclical dynamics, including recessions, fuel prices, and pandemics. Building aircraft is a time- and resource-intensive process that requires long lead-time horizons to match forecasted future demand for aircraft with a manufacturer's ability to design and build planes. That said, Boeing's latest forecast through 2041 predicts demand for the entirety of *North America* for the next 20 years to be 6,400 pilots a year, which is far below historic and current ATP production for the *United States*.



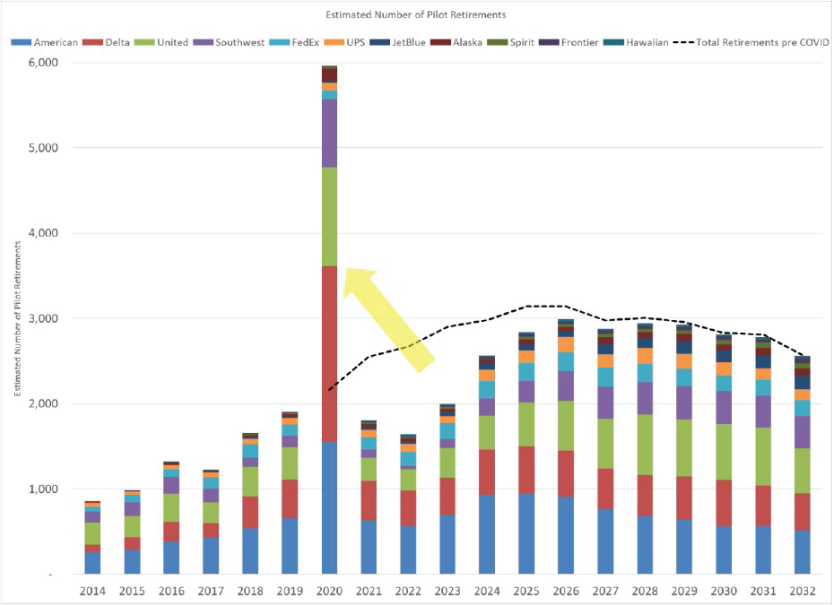
Source: EFA Research

Oliver Wyman, a management consulting firm, has produced popular reports on both the global pilot and North American pilot pipeline following the pandemic. The firm's analysis, however, comingles North American supply with U.S. domestic pilot supply, and fails to provide any substantiating information for its sweeping conclusions about the U.S. market.

Misinformation regarding pilot supply is often related to the little-understood effect of pilot retirements. During the pandemic, airlines offered various "early out" retirement-inducement programs primarily to pilots between the ages of 62 and 65

to help reduce costs for airlines and enable younger pilots to remain in their jobs rather than face furlough.

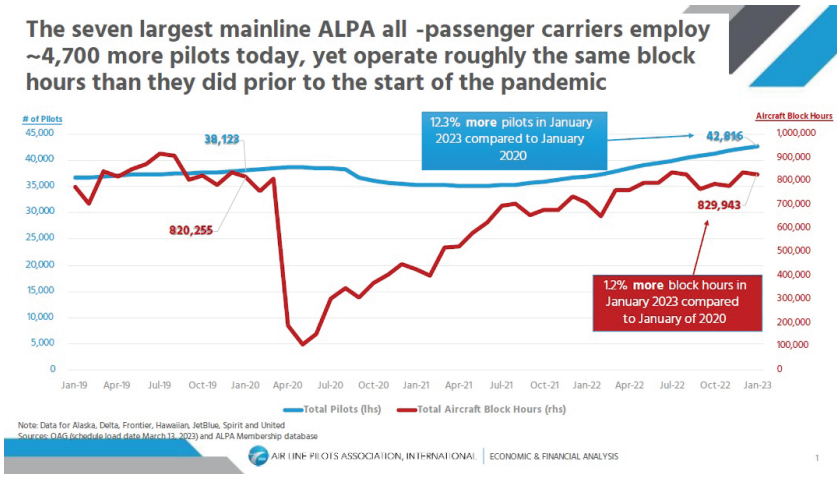
While the prudence of this decision may be questionable in hindsight, these "early outs" had minimal effect on supply. Rather, they simply accelerated retirements that were already planned to take place in the following years for pilots subject to the statutory retirement age of 65. As a result, 2020 saw a higher-than-expected number of retirements as pilots in the oldest age bracket—approximately 62–65 years of age—retired early. Consequently, this will reduce the number of retirements expected in the next few years. Specifically, retirements for 2024–2025 will be below pre-pandemic forecasts, with retirements stabilizing and returning to the pre-pandemic, forecasted levels by 2025.



Dispensing with concerns related to the supply of pilots, ALPA understands that both the available pilot labor market and the provision of flying has been complicated, owing to the difficulties of returning from the pandemic. Most notably, there has been a significant training backlog as a result of the airlines' decisions during the pandemic to park planes, bump pilots off larger aircraft to smaller aircraft fleets and types, furlough during the lapse of the first PSP, and place pilots on inactive status. Given that piloting are a seniority-structured profession, this resulted in a massive, across-the-board reallocation of pilots. Such decisions may have seemed reasonable to carriers as the industry, manufacturers, and analysts predicted an approximately three- to five-year recovery lag. However, because demand returned significantly quicker than airlines predicted, some have consequently had to reverse these decisions and effectively retrain nearly every pilot, often back to the equipment they flew prior to the pandemic, while accommodating *new* pilot hiring due to growth. This massive training event is costly (e.g., mainline retraining cost per pilot is approximately $22,000 to $55,000), time-intensive, and set against a fixed training footprint of limited personnel and simulators that was never designed to respond to a one-off event like a global pandemic.

This training backlog has affected flying capacity as carriers have *more* pilots today than in 2019, but pilot utilization—as measured in block hours—is down. For example, ALPA's seven largest mainline passenger airlines have *more* pilots than in 2019 but are flying substantially fewer block hours as airlines struggle with pilot training throughput. The CEOs of American, Delta, and Southwest agree and have

publicly declared to investors that the constraint on their flying is pilot training, not supply.[2]



Many of the regional carriers have complained about the "pilot shortage," but what they really face is pilot *attrition*. The regional airline industry is necessarily fragile by its structure. Mainline carriers use their regional "feed partners" to operate their regional flying in small markets set by contract. These contracts require the regional airline to cover labor expenses, aircraft maintenance, and aircraft ownership costs, while the major airline effectively controls and limits regionals' economic capability, including ticket pricing and schedules. This arbitrage strategy has historically resulted in low pilot regional pay, poor work rules, single-digit operating margins, fewer regional carriers, and pilot-retention problems.

For decades, pilots entered these low-paying positions at a specific regional airline with a "flow" program to a major carrier partner. However, flow programs have diminished in size and scope, guaranteeing very few mainline positions, while the ULCC carriers increasingly provide an avenue for pilots to move to higher-paying jobs more quickly, achieve greater career progression, or bypass the regional system entirely. Currently, regional airlines are experiencing *captain* attrition, not inadequate numbers of first officers or overall pilot supply. Given the pay differential between regionals and their ULCC and mainline counterparts, captains have been leaving regional carriers as ULCCs and mainlines increased hiring the last two years. Mainline carriers in particular have been seeking first-mover advantages to build out their networks as demand for flying and, specifically, international flying opportunities increase. This post-pandemic growth has created a temporary hiring binge by mainline carriers. By the admission of the largest regional carrier to its investors, with a new, higher-paying contract, they expect to "manage attrition"[3] for captains while their first officer "pilot classes [are] filled."[4] This should be the case for many regional carriers who have followed suit in terms of improving pilot contracts.

Since deregulation in 1978, airlines have made their business decisions based on expected consumer demand, geography of growth, route profitability, network planning and allocated flights, frequency of service, and aircraft purchases accordingly. With the cessation of the Payroll Support Program's requirement for continuation of air services for certain markets served prior to the pandemic, airlines began making substantial changes to meet pandemic-market demand, with leisure travel largely replacing small community business travel and many carriers ending or reducing service to markets *they* deemed no longer economically advantageous. While it is convenient for some airlines to blame pilot availability for their profit-based business decisions to abandon smaller communities, the facts simply don't back up the contention.

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[2] Delta Air Lines, Inc. Earnings Call, Q4 2021, American Airlines Group Inc. Earnings Call Q4 2021, Southwest Airlines Co. Earnings Call Q1 2022.
[3] SkyWest Earnings Call, Q1 2022
[4] SkyWest Earnings Call, Q3 2021

Simultaneously, for nearly a decade, airlines have shifted to "higher gauge" aircraft with more seats and away from fuel-inefficient regional aircraft. According to Wall Street analysts, by retiring smaller regional jets in favor of larger and newer aircraft, carriers will "see operating cost efficiency and market share gains"[5] by improving unit costs, matching consumer demand with supply, and improving aircraft features.[6] Fifty-seat aircraft, which historically operate to smaller markets, are fuel inefficient, cannot accommodate high-end, first-class seating, are expensive to maintain, and consequently are being phased out by the industry.[7] Put simply, airlines are in the business of making money and, right now, the profit is in leisure markets and in-demand cities through the use of larger aircraft. As a result, they are phasing out 50-seat regional jets in favor of narrowbody aircraft and reducing frequencies in favor of larger aircraft with high load factors and greater profitability. Such decisions, which are not made by pilots, are increasingly depriving small and rural markets of connectivity, business opportunities, and growth.

As carriers rationalize their networks and increase the gauge of their aircraft, we must not let market demand sacrifice small and rural air service markets. We believe air service to small and rural communities is a national responsibility and that safe, efficient, and reliable air service to these communities is a critical component of our national air transportation system. We call on Congress to increase its support for the Essential Air Service (EAS) program, and to incentivize greater carrier participation and increased service. The goal of the EAS program was to ensure that air connectivity for smaller and rural airports remained. Congress has, at times, either through the FAA authorization process or annual appropriations bills, impaired the program by limiting funding, restricting eligibility criteria, and eliminating program expansion.

Airlines have cancelled their EAS contracts and thus eliminated air service to smaller and rural communities. Remedying the market failure of the deregulated airline industry's provision of air service to rural and small markets will require consideration for changing the subsidy and enplanement cap, allowing air carriers to renegotiate EAS contracts to account for unforeseen operating costs, revising the DOT's calculation for driving distance, allowing communities that lost EAS service to regain or reestablish eligibility, and revise the DOT's process for carrier selection. ALPA looks forward to working with the Committee to balance these reforms with careful financial stewardship to help ensure the irrevocable benefits of community air service remain a federal priority.

Pipeline Development

While the current supply of pilots is robust enough to meet demand, ALPA is fully committed to inspiring, developing, and supporting the next generation of pilots. Each year, ALPA connects with thousands of students—from elementary to university aged—to inspire young people from all backgrounds to see themselves as pilots. ALPA is also working to create an accessible, inclusive airline pilot workforce for all who are interested and for those who for too long have not been adequately represented in the pilot profession. Women and people of color, in particular, face significant barriers to becoming aviators—and that must change.

Congress can and must do more to reduce the cost of flight training. Specifically, the FAA reauthorization provides an opportunity to amend the Higher Education Access Act of 1965 to ensure flight education and training qualify for federally subsidized student loans for four-year, two-year, and appropriately accredited Part 141 programs. There is no reason for unequal loan treatment between a traditional college student and a student seeking to be a professional airline pilot, who must shoulder prohibitively costly private loans for training. More wholistically, reforming educational opportunities should include increasing participation for underrepresented or nontraditional, low-income, and rural populations as well as providing grants to build flight training and education degree programs at minority-serving institutions, including historically Black colleges and universities. To ensure prospective student success and long-term career attachment, qualifying programs should be structured and accredited training programs, and cost control should be a consideration given that higher education institutions' too frequently capture the cost of federal subsidy increases.

This Committee should consider augmenting and growing the Workforce Development Grant Program originally authorized by the FAA Reauthorization Act of 2018.

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[5] "En-gauging the Growth Engine." Morgan Stanley Research. June 30, 2021.
[6] "United Next—not just an aircraft order." Deutsche Bank Research. June 29, 2021.
[7] "The 50-Seat-Jet Era Will End Soon at Republic Airways Holdings Inc." The Motley Fool. May 22, 2014.

The program authorized support for educational and development projects for pilots and maintenance technical workers. We believe Congress must authorize and ultimately appropriate more resources for the program to have a greater impact. Additionally, we are supportive of adding new workforce eligibilities, including an aviation manufacturing program mirroring the existing programs.

Similarly, more must be done to increase female participation in aviation professions. ALPA was proud to not only fight for the Women in Aviation Advisory Board (WIAAB) as part of the last FAA bill, but also to serve on the Board. The findings in the WIAAB's report confirmed that women and men experience their careers in aviation differently—at all seniority levels—with barriers being largely systemic and no one entity or sector responsible for them or their resolution. The Board's report calls for unions, industry associations, government agencies, and Congress to share the responsibility of making changes to the industry in five areas: culture, recruitment, retention, advancement, and data. For these identified measures, we believe it is important to make the WIAAB permanent so it can focus on increasing and supporting female pilots and other aviation personnel.

We would also draw attention to the Report's many recommendations regarding scheduling, family leave, and accommodations for mothers, including the Nursing Mothers' Accommodations (#40) recommendation. It is long overdue that federal law stop discriminating against pilots and flight attendants regarding pumping by ending their exclusion from the Fair Labor Standards Act's (FLSA) provisions on break time and reasonable accommodations for nursing mothers when aboard aircraft. Congress passed the PUMP Act last year in order to remedy deficiencies in FLSA, but unfortunately industry lobbying killed provisions related to flight and cabin crew protections. Congress must end this gross inequity if it wishes to truly increase and support female growth and retention in the industry.

Protecting and Promoting the Rights of Workers

Any discussion of workforce development must consider the preservation of the core rights of workers. This includes both preserving the rights airline employees enjoy under state and local laws, as well as holding the Department of Transportation to account for its failure to exercise its authority to protect U.S. airline employees from domestic and foreign efforts to undermine their rights and working conditions.

The long-term growth and prospects for the pilot profession and other aviation personnel is based on stability and dignity. This Committee should look to the FAA reauthorization to advance, rather than diminish, these core tenets.

ALPA opposes changes to the Airline Deregulation Act (ADA), in particular its scope of preemption of state law. In 1978 Congress limited ADA preemption so as not to foreclose state and local regulation of traditional areas of state concern regarding labor and employee issues as applied to aviation workers. By expressly tailoring preemption of state law only to circumstances where the states directly regulate customer-centric prices, routes, and airline service, Congress balanced the industry's need for uniformity in its relation to the traveling public while respecting the states' traditional ability to protect and support its citizens. Our members, like workers throughout the economy, avail themselves of the benefits provided by state and local governments to care for sick spouses, children, and to address medical concerns outside the protections provided by their collective bargaining agreements. These long-established protections should not be arbitrarily foreclosed.

As this Committee recently observed in the railroad industry, transportation workers care significantly about matters unrelated to pay, and the flexibility to provide and care for oneself and family is necessary for a stable industry. Attempts to expand the intent and statutory framework of ADA preemption to swallow up and preclude these important state law rights will negate this significant progress. In challenging state and local laws, the airlines have unsuccessfully litigated a series of cases which attempted to block labor, paid sick leave, meal and rest, and related laws, including recent denial of petitions of certiorari before the Supreme Court. The establishment of labor standards falls within the traditional police power of the State—a settled principle that applies with equal force to airlines—and the connection between the ADA and labor policy is extremely attenuated, as recognized by the courts. Any attempt to amend or otherwise undermine the accepted status of the ADA's preemption provisions, contrary to the courts' interpretation, in the pending FAA reauthorization or any other legislation will needlessly undermine long-existing rights of workers and will be strongly opposed by the American labor movement.

It is also long past time that Congress direct the Department of Transportation to consider all of the public interest factors related to the protection of U.S. airline

workers in its statute. In 1980, Congress required the Department of Transportation to consider the effect its economic regulations have on U.S. aviation workers, including in airline licensing cases. Specifically, that the Department "encourag[e] fair wages and working conditions" for U.S. airline employees (49 U.S.C. § 40101(a)(5). However, since deregulation, the DOT has believed that Congress did not want employee matters to play a consequential role in DOT decision making, irrespective of the responsibility Congress gave to it to take these interests into account in the statute.

In recent decisions, the DOT has essentially disregarded Congress' interest regarding the protection of U.S. workers. In 2016, the DOT all but ignored the statutory public interest to grant a foreign air carrier permit to an airline—Norwegian Air International—that engaged in forum shopping to undermine labor standards. In July of 2022, the DOT granted a U.S. airline operating certificate to Waltzing Matilda Aviation LLC without imposing any safeguards to prevent the airline from basing all of its employees abroad under foreign labor laws. By ignoring the public interest, this arrangement would open up the door for would-be investors to set up "nominal" U.S. carriers with otherwise no material ties to the U.S., U.S. employees, or U.S. labor law to operate airlines point-to-point in the U.S. Finally, the Department proactively removed an employee protective clause in the Delta Air Lines-LATAM Joint Venture that would have ensured U.S. employees a fair share of new flying rather than inequitably benefiting the foreign partner.

The Fair and Open Skies Act seeks to remedy some of these failures by (1) *restoring* and *requiring* the multifactor public interest test for foreign air carrier permits (49 U.S.C. 41302), (2) adding a new criterion regarding the undermining of labor standards, and (3) including labor standards language in the negotiating objectives for State and DOT to consider in bilateral negotiations to help prevent the U.S. from entering agreements without considering potential harm to workers and mitigations. We hope this provision will be included in the Committee's FAA reauthorization legislation.

Pilot Training and Aviation Safety

We have not experienced a major, catastrophic accident since February 2009. However, the absence of a fatal accident does not mean we have eliminated all risk. The incidents that have occurred over the last several months demonstrate that there is pressure on the system resulting in risk that we must mitigate. Recently, the FAA Call to Action in response to these recent incidents involving crew incapacitations, runway incursions, and near misses focused on these system pressures and methods to mitigate them.

Accordingly, we must not introduce added risk to our aviation system by reducing qualification and experience requirements. Now is the time to refocus our efforts and make our aviation system even safer.

In the years following the passage of the Aviation Safety and FAA Reauthorization Act of 2010, the airline industry ushered in sweeping changes to pilot qualifications and training and aviation safety that have profoundly improved airline operations and directly contribute to the U.S. aviation safety record. Previously, first officers were required to only possess a commercial certificate, which can be obtained in as few as 200 to 250 hours of total accumulated aircraft flight time. In the context of an FAR 121 operation using a multi-pilot flight deck, the commercial license as established decades ago did not keep pace with the changes to and increased complexity of aircraft and FAR 121 airline operations. Recognizing that the regulatory minimums were outmoded and no longer reflected the increased complexity and duties delineated between "pilot flying and pilot monitoring" of multiple flight deck crew operations, Congress required that each flightdeck crewmember for an FAR 121 air carrier hold an airline transport pilot certificate. Despite Congress's recognition of the critical importance for each pilot on the flight deck to possess an Airline Transport Pilot certificate and the experience commensurate with the responsibility of transporting passengers in FAR 121 operations, this vital requirement has been under attack since this was passed into law in 2010 after a series of fatal accidents.

Simulator Use in Pilot Training Leading to Becoming a Professional ATP Certificated Pilot

Simulators are very useful tools for certain components of pilot training, but have express limits, including for pilots learning to fly. Specifically, these devices are unable to fully replicate flying an airplane in the dynamic airspace system with changing weather conditions, traffic density, communicating with ATC, listening to ATC

communications with other aircraft to maintain situational awareness of their location, and continuously monitoring the system status of the aircraft.

In order to maintain the safety of our skies, we should never remove real-world experience—and certainly not with the current post-COVID stressors on the system. Applying more simulator training toward the issuance of pilot certificates (i.e., Private, Commercial, ATP), is unwise and likely to increase risk in the system. High fidelity simulators are great training devices, but the technology has not yet progressed to the point of making these devices useful in building flight experience and replicating a dynamically changing environment necessary to build judgement and decision making. Performing to operations in canned scenarios in an artificial environment cannot replace experiential learning through flying a real airplane in the NAS. The simulator airspace and air traffic control environment is artificial and cannot fully simulate the complexity, variability, and communications every pilot experiences in the NAS. Therefore, extensive experience in the unstructured actual real-world complex airspace environment, managing expected and unexpected ATC clearances, weather, traffic, and maintenance issues, is essential to developing the skills pilots need.

There are essential skills that pilots acquire with experience, such as those that develop a pilot's judgment to make quick, safe decisions under pressure and preventing situations from escalating. While attempts are made in training to recreate experience that builds these skills, this real life experience cannot be equaled with training in a simulator.

By contrast, simulators are well suited for introducing procedures to pilots in a controlled training environment, particularly flying instrument procedures (e.g. instrument arrivals and approaches to airports). But as a pilot is learning to fly instrument procedures, putting them into practice in actual flight with all the associated pressures and demands is completely different. In the simulator, if a pilot does something wrong or gets confused, the flight can be stopped. As pilots build experience toward qualifying for the ATP by flying in real world conditions, they are forced to resolve and safely continue flight when encountering problems. This builds resilience, judgement, decision making and ensures the pilot is capable before they have the responsibility of transporting hundreds of passengers or large quantities of cargo.

Similarly, simulators have limitations for learning how to control the aircraft through coordinated use of the flight control systems. Maintaining coordinated flight ensures safe control of the aircraft, and is a critical skill pilots develop as they obtain their required training and experience for certificates. Failure to maintain coordinated flight can cause loss of control accidents which have been a leading cause of fatalities.

Overreliance on simulators as pilots are learning to fly and become professional ATP certificated pilots would be a detriment for pilot skill, judgement, and decision-making development, and ultimately flight safety. Simulator credit should not be increased and should not replace experience operating a real airplane in the airspace system. The current requirements to gain experience in an actual airplane, which limit the number of hours in a simulator toward a pilot certificate, are critical for developing requisite pilot skills.

It is important to note that the term simulator is often used generically to describe a wide range of flight training devices and requires further clarification to delineate the capabilities of the device are and how closely it can replicate flying an airplane. Some training devices only resemble a generic aircraft but not a specific aircraft like a Cessna 172 or a Boeing 737. Some devices may be operated from a laptop (e.g. Microsoft Flight Simulator) while others are a replica of an actual flight deck sitting on top of 6 hydraulic or electric legs that cause the unit to move similar to the aircraft's movements. It is important to know exactly what device is being proposed for what use.

Aviation Training Devices (ATD) provides a platform and design for both procedural and operation tasks without motion. In contrast, most air carrier flight simulation is conducted using Full Flight Simulators (FFS) and Flight Training Devices (FTD). The latter two devices are collectively referred to as Flight Simulator Training Devices (FSTD). FFSs move around to mimic the motion of an airplane climbing, descending, and turning in order to help replicate the sensations a pilot feels in an airplane. FTDs are more advanced than ATDs but, like ATDs, they do not have motion capability, and some don't have a visual system to provide a simulated view out the flight deck window. FFSs are currently only required to be used by air car-

riers during the final evaluation stage of air carrier flight training, and a small number of specific tasks during air carrier training leading up to evaluations.[8]

Very few flight schools have invested in a multi-million dollar FFS due to the cost to operate FFSs, particularly when an ATD is allowed by regulations to be used for the simulator time that can be applied toward pilot certificates. Thus, the advanced FFS that most closely resemble flight are not heavily utilized at most flight schools.

The current FAA regulations allow for up to 100 hours[9] of the total time required to qualify for an ATP to be obtained in a FFS, FTD, or an ATD through a Letter of Authorization (LOA).[10] [11] Due to the option for LOA approval of ATDs, if more simulator time were granted toward the ATP or other certificates, much lower fidelity devices than FFSs will be used. Even if the highest fidelity FFSs were required to be used without exception, safety would be sacrificed due to FFSs still not fully replicating flight in an airplane, which is essential when pilots are still training to become professional ATP certificated pilots. Once pilots are ATP certificated, simulators are well suited for helping to ensure their skills are retained, and to exercise essential skills that are rarely encountered when flying a real airplane (e.g. engine failure).

The International Civil Aviation Organization (ICAO) also currently sets the limit at 100 hours[12] of simulator time that can be applied toward an ATP. If the U.S. were to allow additional simulator credits, the FAA would have to file a difference and be out of compliance with the global standard at ICAO. In addition, the FAA has established a joint industry-government committee specifically to discuss, prioritize, and provide recommendations to the FAA concerning pilot training. This committee, the Air Carrier Training Aviation Rulemaking Committee (ACT ARC)[13] is the appropriate venue to consider any proposals to increase simulator time allowed to be applied toward the ATP. Again, at a time of dynamic changes in the aviation system, including constant industry-wide hiring and integration of new entrants, we should not be considering adding additional risk by lowering training and experience requirements.

An important consideration regarding pilot training must consider how pilots actually build flight time. Contrary to the rhetoric that new pilots gain 1,500 hours of flight time by renting a small airplane in fair weather, many pilots after obtaining a commercial pilots license will obtain a certified flight instructor (CFI) certificate and get paid to instruct the next generation of pilots as their primary means of building the flight time experience needed to acquire an ATP certificate. Additionally, pilots fly for commuter or on demand air carriers in revenue service conducting operations under Part 135 regulations, typically with 9 or fewer passengers. Finally, pilots also build their flight time experience to qualify for an R–ATP or full ATP by flying for a charter operator with a local fixed base operation under FAR 135 and business or corporate flying under part 91 or 91K. Some pilots will do a combination of all these things after they obtain their commercial pilot certificate in order to build experience to qualify for an ATP. However, most will flight instruct either at the university where they completed their degree or at a civilian flight school. Put simply, pilots build hours toward the ATP or R–ATP certificate by flying

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[8] See Part 60 Table B1B in Attachment 1 of Appendix 2 and the March 30, 2016 14 CFR Part 60, Flight Simulation Training Device Qualification Standards for Extended Envelope and Adverse Weather Event Training Tasks; Final Rule, Federal Register page 18206.

[9] 61.159(a)(6) "Not more than 100 hours of the total aeronautical experience requirements of paragraph (a) of this section or § 61.160 may be obtained in a full flight simulator or flight training device provided the device represents an airplane and the aeronautical experience was accomplished as part of an approved training course in parts 121, 135, 141, or 142 of this chapter."

[10] 2016 final rule—Aviation Training Device Credit for Pilot Certification—https://www.federalregister.gov/documents/2016/04/12/2016-08388/aviation-training-device-credit-for-pilot-certification—"FAA approves the use of ATDs for private pilot, commercial pilot, and airline transport pilot certification through the issuance of LOAs under the Administrator's authority in § 61.4(c)."

[11] 61.4, Qualification and approval of flight simulators and flight training devices (a) states "Except as specified in paragraph (b) or (c) of this section, each flight simulator and flight training device used for training,"; (c) states "The Administrator may approve a device other than a flight simulator or flight training device for specific purposes."

[12] ICAO Annex 1, section 2.6—ATP, paragraph 2.6.3.1.1 "The applicant shall have completed not less than 1,500 hours of flight time as a pilot of aeroplanes. The Licensing Authority shall determine whether experience as a pilot under instruction in an FSTD is acceptable as part of the total flight time of 1,500 hours. Credit for such experience shall be limited to a maximum of 100 hours, of which not more than 25 hours shall have been acquired in a flight procedure trainer or a basic instrument flight trainer."

[13] See public ACT ARC website—https://www.faa.gov/about/office__org/headquarters__offices/avs/offices/afx/afs/afs200/afs280/act__arc/

in real world conditions, which gives them necessary experiential training to progress to flying transport category aircraft under FAR 121.

Increasing the hours that can be done in the simulator would also significantly hamper the ability to maintain the needed CFI population to train future pilots. After pilots obtain their appropriate certificates (i.e. private pilot and commercial pilot) and instrument and multi-engine ratings, they typically have around 200 to 250 hours of flight experience. This leaves pilots with 800 hours of experience to build to qualify for the R–ATP pilot certificate. Currently CFIs are reaching the qualifications to train new CFI's [14] before they meet the current requirements to be a First Officer for an FAR 121 air carrier. Reducing the number of hours or adding credits toward an ATP will negatively impact the availability of flight instructors and cause significant strain on flight schools and aviation colleges.

I appreciate the Committee's thoughtful and thorough consideration of our industry's workers and our contributions to the safest period in air transportation in history. The pilots of ALPA stand ready to assist this Committee with its important policy and oversight work.

Mr. YAKYM. Thank you, Captain Ambrosi. Yesterday, the committee received a letter from former FAA Administrator and former ALPA president Randy Babbitt and former Acting FAA Administrator and airline pilot Dan Elwell, encouraging the committee to consider the quality of training hours for pilots on their way to an ATP. I ask unanimous consent that a copy of that letter from two former FAA leaders be entered in the record.

Seeing no objection, so ordered.

[The information follows:]

Letter of April 18, 2023, to Hon. Sam Graves, Chairman, and Hon. Rick Larsen, Ranking Member, Committee on Transportation and Infrastructure, and Hon. Garret Graves, Chairman, and Hon. Steve Cohen, Ranking Member, Subcommittee on Aviation, from a former Administrator and Acting Administrator of the Federal Aviation Administration, Submitted for the Record by Hon. Rudy Yakym III

APRIL 18, 2023.

The Honorable SAM GRAVES,
Chairman,
Committee on Transportation and Infrastructure, 2165 Rayburn House Office Building, Washington, DC 20515.

The Honorable RICK LARSEN,
Ranking Member,
Committee on Transportation and Infrastructure, 2164 Rayburn House Office Building, Washington, DC 20515.

The Honorable GARRET GRAVES,
Chairman,
Subcommittee on Aviation, 2165 Rayburn House Office Building, Washington, DC 20515.

The Honorable STEVE COHEN,
Ranking Member,
Subcommittee on Aviation, 2164 Rayburn House Office Building, Washington, DC 20515.

DEAR CHAIRMAN GRAVES, RANKING MEMBER LARSEN, CHAIRMAN GRAVES, AND RANKING MEMBER COHEN:

We write to you today to share our thoughts on the airline pilot shortage and our recommendations on how we believe Congress and all stakeholders can work together to modernize the way we train and qualify airline pilots.

There is no denying that the United States has a very real shortage of airline pilots. As a result, airlines are eliminating markets and curtailing growth. The impacts to domestic air service and connectivity are staggering.

[14] See 14 CFR, Part 61, 61.195(h), Qualifications of the flight instructor for training first-time flight instructor applicants

Testifying before the U.S. Senate Commerce Committee last year, Transportation Secretary Buttigieg called the pilot shortage "a national issue" that is "... affecting the whole domestic aviation industry but disproportionately affecting smaller regional airlines."[1] We agree. And, this national issue requires immediate and focused attention by Congress, U.S. regulators, and all aviation stakeholders. We can and should resolve the pilot shortage, but we must do so while maintaining the incredible safety record we have worked so hard to achieve.

Drawing on our combined century of aviation experience,[2] with more than forty years as airline and military pilots, we recommend the following solutions:

1. Advance regulations governing pilot training and qualification to keep pace with continuous improvements in training programs and technology.
2. Update the pilot training model to achieve better-designed academic and mentored flight training.

Taking both steps will create a more diverse and well-qualified pilot pipeline, ensure greater safety in the training environment, and significantly improve training outcomes.

Before 2013, most regional airline First Officers held a commercial certificate when hired and needed an Airline Transport Pilot (ATP) certificate with 1,500 hours in flight before upgrading to Captain. In the Airline Safety and FAA Extension Act of 2010 (2010 Airline Safety Act,)[3] Congress mandated that all pilots, including First Officers, must hold an ATP before being hired by an airline. Recognizing the benefits of structured training, Congress also directed the Federal Aviation Administration (FAA) to approve additional qualification pathways with fewer hours but more structured training, when doing so enhanced safety more than fully complying with the flight hours requirement. The FAA finalized the First Officer Qualification rule in 2013, requiring an ATP certificate with 1,500 flight hours for First Officers without approved structured training backgrounds and approving three structured training pathways for First Officer qualification where fewer flight hours but more structured training produced at least an equivalent level of safety.[4] Today, First Officers qualify with 1,500, 1,250, 1,000 or 750 flight hours, depending on their training background.

While the new First Officer standards set the U.S. apart from the International Civil Aviation Organization[5] by requiring six times more pre-hire flight time than anywhere else in the world, we are not suggesting that the FAA should revoke these requirements. However, the FAA should continue to advance the regulatory framework it put in place a decade ago, which today fails to allow for, let alone incentivize, the continuous improvement in pilot training that Congress intended.

Additionally, the regulations do not sufficiently distinguish between flight unsupervised/non-training flight hours and supervised/training flight hours. For most pilots, flight hours usually take place in a small, piston engine aircraft in clear weather, and uncrowded airspace. Supervised training flight hours entail a combination of exceptional curriculum, flight instruction, flight simulation, and relevant practice, practice, practice. Pilots can practice in airplanes, flight training devices, and simulators. Simulator training assures exposure to all-weather events and emergencies that cannot be safely practiced in flight. In contrast, racking up non-training flight hours does little to improve the skills, knowledge, and experience demanded of pilots operating in a multi-engine, multi-crew, busy airline environment.[6] Unfortunately, because of regulations written decades before the incredible advances in full-motion, high-fidelity simulators, and advanced training devices, pilots are restricted from logging more than about seven percent of their ATP-qualifying time in simulators. As a result, most pilots accumulate over 75 percent of their airline-qualifying flight hours outside of a curriculum and monitored environment. There is an old aviation quote that is particularly fitting: "The pilot who teaches himself [or herself] has a fool for a student."[7]

Refreshing the regulatory environment with additional structured training programs can ensure more of our future commercial airline pilots receive training in

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[1] U.S. Department of Transportation Secretary Pete Buttigieg, Testimony before the U.S. Senate Committee on Commerce, Science, and Transportation (May 3, 2022).

[2] Randy Babbitt is a Former FAA Administrator, ALPA President and Airline Pilot. Dan Elwell is a Former FAA Deputy Administrator, FAA Acting Administrator, Airline Pilot, and United States Air Force Pilot.

[3] P.L. 111–216 (August 1, 2010).

[4] *FAA Final Rule on Pilot Certification and Qualification Requirements for Air Carrier Operations*, 78 Fed. Reg. 42324, 42352 (July 15, 2013); and *Airline Safety and Federal Aviation Extension Act of 2010*, Pub. L. No. 111–216, § 217, 124 Stat. 2348 (2010).

[5] ICAO, located in Montreal, Canada, is the international body for aviation standards.

[6] Pilot source studies, see: www.pilotsourcestudy.org

[7] Robert Livingston, *Flying the Aeronca*, 1981.

a multicrew environment, learning critical commercial airline concepts like Crew Resource Management and standards of professionalism. An updated training model would also allow flight schools to continuously adapt to new advancements in aircraft technology and training techniques. Experience tells us that an updated model should increase, rather than limit, time spent in modern simulators that expose trainees to emergency scenarios and hostile weather events like icing and thunderstorms—too dangerous to learn or practice in the air. Airlines' own flight training has also evolved. It is not a coincidence that today's commercial airline pilots complete nearly all necessary initial or transition flight training in a simulator.

Unfortunately, the U.S. pilot training paradigm is flipped from where it should be. Today's approach *maximizes* 'simple flight hours' but allows *minimal* credit for the use of advanced simulator and ground training devices; we strongly believe it should be the other way around. The FAA can and should continue to evolve alternative qualification pathways to keep pace with continuous improvements in training programs and technology. The U.S. Air Force is doing just that, and their pilot training is rightfully seen as the gold standard.

Advancing the regulatory framework will drive innovation and encourage the development of more quality flight training programs, facilitating greater access to the pilot profession from a broader and more diverse population. This is particularly important when many aspiring pilots cannot afford today's flight time-centered pathways. Most importantly, our future pilots will be better trained, in a safer training environment with a dramatically smaller carbon footprint.

We thank you for the opportunity to share our thoughts and recommendations and we stand ready to work with you, the Committee, and all stakeholders to modernize our pilot training regulatory framework and model by incentivizing 'quality flight hours' through FAA-approved structured training programs. Doing so will help address the airline pilot shortage and help to restore air service losses felt by so many communities. Most importantly, it will further enhance the United States' enviable aviation safety record.

J. RANDOLPH BABBITT,
Principal Partner, Babbitt & Associates, LLC.

DAN ELWELL,
President, Elwell & Associates, LLC.

Mr. YAKYM. I now recognize myself for 5 minutes as we will now be moving into Member questioning. Thanks again to our witnesses for being here as we examine the challenges facing the aviation workforce. In the last few weeks, I visited the South Bend International Airport in my district as well as the Lift Academy for Republic Airways in Indianapolis. A common theme for both visits was the pilot shortage.

South Bend has big plans for new routes to further connect our community to the rest of the world and drive our local economy forward. But the feedback they are getting from the airlines is they are interested, as they have specific routes planned that are identified that we discussed in the meeting, but they don't have the pilots to do it, and they can't add the flights until they have the crews, and right now they are telling us that they have no crews.

So, let's be clear. I think the United Airlines CEO put it best in a recent earnings call, and I quote: "There is a pilot shortage, and that is real. And it is going to take years to resolve."

Something I want to focus on this morning is training and the concept of quantity versus quality. The value of the hours spent in a Cessna—as I have gone through pilot training myself and am a check ride away of having my own private pilot certificate—and the value of someone like me spending time in a Cessna running laps around an airfield on a bright sunny day, stands in stark contrast to an hour in a simulator learning how to respond to emergency scenarios that builds muscle memory in preparation for an emergency scenario.

Mr. Thress, you say that simulators can capture a pilot's performance data that can then be used to show the pilot how and where to improve. How prevalent is that technology today? And can you give us a quick example of how that works, how data points are captured, and what the presentation back to the pilot looks like?

Mr. THRESS. Gladly. So, very similar to most commercial airplanes have a focal system which measures the pilot's performance both with respect to where he puts the airplane in the airspace, the simulators also capture control position inputs during different maneuvers.

So, a good example is an engine failure during takeoff. The most critical time for an engine failure is that decision speed called V1. And we train that for every pilot that we train. So, if a pilot's struggling with the V1 cut, as we refer to it, we can show him how he is manipulating the physical controls of the airplane versus a successful maneuver. And he can say, OK, I am putting in the wrong rudder, or I am putting in not enough rudder, or I am putting in too much rudder during the cut. So, you can multiply that across a whole variety of different maneuvers, but that is the basics of how it works. I hope I answered your question.

Mr. YAKYM. Thank you. And can an aspiring airline pilot learn any of that flying in a Cessna, as I do, under ideal conditions?

Mr. THRESS. So, training in the aircraft itself is limited to some, what I would call, marginal scenarios. So, let's take that same engine failure as an example.

So, if you do an engine failure training in the airplane, instead of total loss of the thrust, the power is typically reduced to idle where the engine is still making 30 to 40 percent of its maximum thrust. So, there is the first on realism.

The second one is for safety reasons. The engine power cannot be reduced until at least 500 feet above the ground. So, you kind of miss the whole critical training element of the engine failure occurring at the most critical point of V1.

Mr. YAKYM. Thank you. Mr. Ambrosi, let's consider two theoretical aspiring airplane pilots. One spends 1,500 hours flying in Class E or Class Echo airspace with zero simulator time. The other has completed 1,500 hours, 1,400 of those were spent in Class E airspace. But 100 of those were in a simulator environment of a regional jet flying in Class Bravo airspace. In varying weather conditions and mechanical scenarios, we see the data-driven debriefs showing how they can improve their response to the scenarios. Which pilot do you think is better prepared to be an airline pilot?

Mr. AMBROSI. Well, sir, thank you for the question. I would point out that the current system allows for 100 hours of simulator training, just as in the scenario that you point out.

Mr. YAKYM. So, which one of those pilots again would be better prepared, do you believe?

Mr. AMBROSI. As long as that simulator training has the curriculum to it where they are actually practicing that, and they are not just sitting in a simulator, or sitting at a desk or a laptop, then I would agree with you that that scenario would be a better trained pilot.

Mr. YAKYM. So, we can agree that not all flight-hours are created equally, and that the quality of time spent in the simulator—if it is quality time—is indeed time that is well spent?

Mr. AMBROSI. If it is quality time. But I will point out that there is no replacement for experience. I will tell you I have been flying for over 25 years in an airline environment, and simulators are critical. I have spent more time in a simulator than anybody in this room. And we train specific things—engine failures, just like the gentleman said. However, I am not paid to fly a simulator. I am paid to fly people across the Atlantic to their destinations in Europe in a real environment where things come up that you are not expecting in real-world conditions. So, yes, there is significant value to simulation time, but there is no replacement for those of us that operate in the real world with passengers behind us.

Mr. YAKYM. Thank you, Mr. Ambrosi. I will now recognize the ranking member, Mr. Cohen, for 5 minutes.

Mr. COHEN. Thank you, Mr. Chair. Captain Ambrosi, do you think 15 hours is sufficient time for a pilot to train in flight?

Mr. AMBROSI. Did you say 15 hours or 1,500 hours?

Mr. COHEN. 1,500.

Mr. AMBROSI. So, if I may, we hear the 1,500-hour rule a lot. So, 1,500 hours is a basis which is a number that is out there. If you have advanced academics, you can drop down to 1,000 hours, 1,250 hours, 750 hours because of the recognition of military training. So, there are plenty of pipelines. And almost 50 percent of all the pilots that go to the airlines are coming through one of those other programs that recognize less than 1,500 hours. So, it is not a direct 1,500-hour rule.

I will also point out that under the current law, the 2010 bill, people can bring—proposals can come in front of the aircraft—the ACT ARC, Air Carrier Training Aviation Rulemaking Committee, just like those did, and there can be credit. So, all the proposals that are bringing on simulator time or anything else can go to the ACT ARC can be recognized. There is a process in place. There is no legislative change required.

Mr. COHEN. Do you think it would be a good idea to maintain the current rules?

Mr. AMBROSI. Absolutely. Look, since 2010, fatalities are down 99.8 percent. I mean, that is a number that nobody can play with statistically. Fatalities are down 99.8 percent. We haven't had a fatal accident. We are the safest in the world.

Comparing ourselves to other places around the world that have lower training—do people in small communities deserve less safe service? No. We should be striving to improve safety and not just have some lower level of safety just because we have had a good 10-year period with no fatalities.

Mr. COHEN. Would you think it would be a good idea to keep the current rule which we have and also add, say, 60 hours on a simulator in addition to the time you have in flight?

Mr. AMBROSI. I would point out that, let's say, 1,500 hours: 100 of that already today can be in a simulator.

Mr. COHEN. Right, but let's say you take that out of that, and you make the 1,500, and less, 750 for the military, et cetera, you are up in the air flying around on a pretty day, et cetera, et cetera.

And then add to it an additional 60 hours in a simulator, that is in addition to, not in lieu of.

Mr. AMBROSI. There would be nothing wrong with that, but I would say today's rule allows for simulator time that is not even being used.

Mr. COHEN. Right.

Mr. AMBROSI. But most of that 100 hours is not being used today. So, they could go ahead and use that 100 hours today.

Mr. COHEN. Thank you, sir. Mr.—is it Threece [sic]?

Mr. THRESS. Thress.

Mr. COHEN. Thress, I'm sorry. Do you think the 1,500 hours is good or bad, the rule we have got with the annotations that the captain——

Mr. THRESS [interrupting]. Yes, I think I would shy away from the 1,500-hour rule, making comment on that. I think it is for the regulator to observe. I am just saying that of the hours that typically go toward the 1,500, a lot of them are at a very simple, unrealistic, as was discussed previously, not relevant to the commercial airline operating environment, in that the simulator is much more valuable than flying around on a blue sky day in a 172.

Mr. COHEN. Well, what about keeping the rule like it is and adding that you also have to do 60 hours in a simulator.

Mr. THRESS. Yes, I have no objection to that. And I think that would add value and add richness and experience and build safety for the aviation industry.

Mr. COHEN. Thank you, sir. Now, let me ask the panel to refresh my recollection. I have had some memory of an African-American pilot—and this goes to a lack of African-American opportunities in the air industry—but an African-American pilot who I think flew around the world solo. And he might have been from Miami. And he might have got in some—are you familiar with it?

Ms. BLACK. Yes.

Mr. COHEN. Is there a program that he got started or he was part of in Miami to try to get students there involved in the aviation industry? And how has that worked out?

Ms. BLACK. I think you are referring to Captain Barrington Irving.

Mr. COHEN. Yes, that's right.

Ms. BLACK. It is wonderful. If I had a check for $1 million, I think I would try and give it to what he is doing, because he has shown people in communities that are similar to the community that he came from that there is room for them in aviation. I think it has been a great success. He has moved this. He's now got documentaries going, and so, it has been great on outreach. But he is also showing them how to get into the industry. Unfortunately, those high career barriers remain, and so, we need to follow up those great outreach efforts where things that actually give people funding to access this career we have woken them up to.

Mr. COHEN. Since J. Beresford Tipton is not here to give you $1 million, how would you recommend that Congress with its millions of dollars utilize Mr. Irving and his program?

Ms. BLACK. We all had a great start with the workforce grant programs. That has been really important. Those were oversubscribed on the maintenance side. On the pilot side, that could be

expanded to a pay a little bit more for pilots that are trying to go through training and education and support some of that. So, increasing that funding would be a help. And we expect legislation, the Flight Education Access Act, that will help right-size the gap between what you can get out there in student loans that are capped today and the actual cost of flight training, which is inherently more expensive.

And there is about an $80,000 gulf. So, if you come from a lower income family, you can't get across. And, in fact, we have a very modest scholarship program. We give about $4,000 or $5,000 out a year. But we often hear from people that if it were not for that modest amount we gave them, they would have stopped the education flight training part of their program. So, it is clear we need to do more to give people education funding.

Mr. COHEN. Thank you. Could you share some of the information about Mr. Irving with my staff, so that we refresh my recall, and maybe we can contact him?

Ms. BLACK. We would love to share information and make an introduction if you would like.

Mr. COHEN. Thank you so much. I yield back.

Mr. YAKYM. Thank you, Ranking Member Cohen.

The Chair now recognizes Mr. Bean for 5 minutes.

Mr. BEAN OF FLORIDA. I thought it was going to be a lot longer, Mr. Chairman, so, thank you so much.

And good morning, panelists. Good morning, T&I subcommittee. What an honor to be with you and for you all to be forward.

Captain Ambrosi, you are a lot of time sitting up front in the plane. Sometimes you are sitting in the back. If you are sitting in the back of the plane, what scares you? What do you worry about if you are sitting in the back of the plane? Do you ever get concerned about anything? What should the public be concerned if they are sitting in the back of the plane?

Mr. AMBROSI. Maybe food poisoning. No, in all seriousness, our airlines have great food. I am not going to—look, it is about having well-trained pilots, flight attendants, mechanics, making sure that this industry is as safe as it is today.

What I worry about are the attacks by special interests to roll back or change regulations that have worked. Again, we are back to a—this is simple—99.8-percent reduction in fatalities in the last 10 years since the 2010 FAA bill. It is easy. We don't have to talk about any other numbers besides that.

Safety, let's do things to enhance. Let's make it better. We are the gold standard of aviation: my first ever hearing in the short 3 months I have been in this position. What are we going to do to make that even better? We shouldn't be talking about equivalent or rolling back. We should be: How do we make it better?

There has been a series of recent incidents. It has been in the news. I participated in an FAA safety panel. With those kind of things going on, because of all the new in the system, why are we discussing potentially rolling back or decreasing a level of safety?

Mr. BEAN OF FLORIDA. Ten-four, ten-four. No, thank you for sharing that.

I am on several other committees. I am on Education and the Workforce, Small Business. Of course, all these committees meet at

the same time. But you name the industry and everybody is suffering from lack of skilled workers in their industry. You name it, and so, everybody.

So, we have to rethink how we are getting kids fired up about careers, whether they are a pilot or an auto mechanic or, more importantly today, an aircraft mechanic or somebody that can fix a simulator.

So, let's rethink it. The Pell grant. I know, Dr. DeVivo, you talked about changes to the Pell grant. More money is one thing, but is there anything we need to do? Pell grant is now 50 years old. What do we need to change to the Pell grant besides just adding money to it?

Ms. DEVIVO. That is a great question. So, for most students from underresourced communities, Pell is helpful, but it is all the expenses around going to school that are often not funded. So, if you are commuting, how do I afford a bus pass? How do I make sure I can afford my books? How do I make sure I can eat?

Vaughn students, oftentimes, six times over the last year they experienced a shortfall in income, right? And it is often for things like rent and Wi-Fi and those kinds of expenses. And so, Pell is terrific in that it helps support tuition and fees, but it is those expenses around college that are very——

Mr. BEAN OF FLORIDA [interrupting]. I got you. That is part of growing up, though. Going to college is not just the classes, but it is learning that you have got to do your homework, and no one is there to get you up.

So, what do we need to do? If we were going to make—if we were going to make over our education system and to make a path, what would it look like? I know you have programs to teach mechanics.

Ms. DEVIVO. Pilots, engineers.

Mr. BEAN OF FLORIDA. But you are a college. What about the kid that doesn't even go to college? How do we—and I will throw this as a tossup to anybody. How do we reach—we are not doing a good enough job to get kids—I say kids but just young people or anybody, really—fired up about different professions. What do we need to do? Anybody want to jump in?

Brad Thress, what say you?

Mr. THRESS. So, I am really out of my swim lane here, but I would say that the culture in America toward education is overly focused on the 4-year degree, and I think we need to start early in high school and channel people and create——

Mr. BEAN OF FLORIDA [interrupting]. Right. How do we do—I agree with you. How do we—I mean, do we have——

Mr. THRESS [interrupting]. You have to create a pathway.

Mr. BEAN OF FLORIDA [continuing]. Career days? I mean, would it be industries? Would you take some kids to let them shadow with some of your mechanics?

Mr. THRESS. Certainly. But I think the pathway has got to be very clear. So, the pathway toward becoming a commercial airline pilot at Embry-Riddle is crystal clear, down to the hour.

Mr. BEAN OF FLORIDA. Yes.

Mr. THRESS. That pathway toward becoming a windmill technician or an auto mechanic or a sim tech is not as clear, and it has to start early. It has to start in high school.

Mr. BEAN OF FLORIDA. Got you. Got you.

Captain, jump in.

Mr. AMBROSI. Yes. I would just add that we understand. And at the Air Line Pilots Association, we begin our reach all the way down to middle schools. We do over 1,000 visits a year at middle schools. We are trying to expand to make a more diverse workforce. Our pipeline is full because, as you said, it is very clear how to get there, but we need to get people inspired—minorities, women.

My daughter is 8 years old, and I want her to have opportunities that females 30 years ago when I was going through it didn't have. So, it is about getting out there and doing that outreach.

Mr. BEAN OF FLORIDA. Ten-four. My time is expired. I love the conversation, love the ideas and thoughts. And so, thank you for being a part of the debate today. Thank you.

I yield back, Mr. Chairman.

Mr. YAKYM. Thank you, Mr. Bean. I always appreciate your enthusiasm, sir.

And with that, I would like to recognize the ranking member of the full committee, Mr. Larsen, for 5 minutes.

Mr. LARSEN OF WASHINGTON. Thank you, Chair.

First, I would like to enter into the record statements from the Coalition of Airline Pilots Associations, the Southwest Airlines Pilots Association, the Flight School Association of North America, and Captain Sully Sullenberger, all supporting the preservation of the current 1,500-hour rule, in addition to other comments they have.

Mr. YAKYM. Without objection, so ordered.

[The information follows:]

Statement of Captain Larry Rooney, President, Coalition of Airline Pilots Associations, Submitted for the Record by Hon. Rick Larsen

Chairman Graves, Ranking Member Larsen, and members of the committee, on behalf of the Coalition of Airline Pilots Associations (CAPA) and the 35,000 professional airline pilots we represent, I would like to thank you for the opportunity to provide a statement for the hearing record.

I am Captain Larry Rooney, President of the Coalition of Airline Pilots Associations (CAPA), the world's largest professional pilot trade association, representing more than 35,000 pilots at American Airlines, UPS Airlines, NetJets, Republic Airways, Atlas Air, Horizon Air, ABX Air, Omni Air International, Silver Airways and Cape Air.

CAPA would like to extend our appreciation to the Transportation and Infrastructure Committee Chairman Sam Graves, Ranking Member Rick Larsen, members of this committee, and staff for holding this important hearing. The unprecedented safety record that we've benefitted from, since Congress mandated the higher qualification standards, should serve as a testament to the life-saving benefit that it brings to the aviation industry.

Today, we are at a crossroads. The aviation industry is experiencing significant safety-critical stressors highlighted in a recent FAA Safety Summit, which barely scratched the surface of the long safety road that lies ahead. Do we allow near-term operating pressures that the industry is experiencing to erode our exemplary safety record, or do we continue to hold firm that safety remains paramount. As stated by my friend and colleague Captain Sully Sullenberger, "There's simply no substitute for experience in terms of aviation safety." I wholeheartedly agree with his real-world analysis and perspective.

The responsibility of safely transporting passengers through a congested air traffic control system in challenging atmospheric conditions can only be learned, developed, and honed through actual flight experience as the safety of the traveling public demands no less.

CAPA fully supports the ATP as the minimum requirement for all Part 121 and 135 pilots employed by U.S. commercial air carrier operators, congressionally mandated and contained within the Airline Safety and Federal Aviation Administration Extension Act of 2010 (Pub. L. 111–216) that the Airline Transport Pilot (ATP) License serves as the minimum standard for employment as a pilot with an FAA Part 121 or 135 air carrier.

The ATP provides the academic coursework, flight training and experience needed for the safe piloting of today's complex, high-speed aircraft through a congested, multifaceted air traffic control network in challenging weather environments.

All mainline and regional air carriers now require the ATP for employment and to provide for the "One Level of Safety" that the traveling public deserves.

The 1,500 flight hours that the ATP requires develops a mature, experienced and professional aviator who has the foundation to exercise prudent judgment while being responsible for the safe transportation of hundreds or many times thousands of passengers during a typical flight duty period.

- Entry-level First Officers have immediate flying duties and are equitably responsible as the Captains they serve for the safe operation of the aircraft and for the passengers lives entrusted to them.
- ATP requires 500 cross-country flight hours, 400-night hours.
- ATP training and evaluation standards are tailored to commercial operations at large airports with complex arrival and departure procedures.
- Achieving the ATP requires additional requirements for validation and evaluation generating more complete pilot performance documentation.
- 1,500 hours develops better airmanship skills.
- Spatial orientation, physiological factors and situational awareness are finely honed with more flight time.
- Commercial pilot (only) licensed aviators account for 3x the accidents as ATP licensed pilots.
- 50% of US domestic flights are flown by Regional Carriers.
- "Quantity" of flight hours have a "Quality" of their own.

The previous minimum hiring requirement for U.S. commercial Part 121 and 135 operators was 250 flight hours, a commercial pilot license and an instrument rating.

Similar to the medical profession where a doctor who is responsible for only one life at a time must first complete undergraduate study, medical school, residency and pass board certified exams, CAPA believes airline pilots should be held to the same rigorous standards contained within the ATP process before practicing their craft.

CAPA does not support any additional reductions beyond the requirements already contained in the ATP pathways established by Congress.

Chairman Graves, Ranking Member Larsen, and members of the Subcommittee, I would like to thank you again for the opportunity to provide a statement of the hearing record. I am happy to respond to any questions that the subcommittee may have.

Statement of Captain Casey Murray, President, Southwest Airlines Pilots Association, Submitted for the Record by Hon. Rick Larsen

MAINTAIN "GOLD STANDARD" IN AVIATION SAFETY

Following the tragic 2009 Colgan Air crash near Buffalo, New York, Congress passed the Airline Safety and Federal Aviation Administration Extension Act, sometimes called the "1500-hour rule." This act mandated that all Part 121 pilots obtain an Air Transport Pilot ("ATP") rating. Flight simulator time can account for up to 25 of those required training hours for an ATP. Creating the ATP requirement—including its subcomponents like simulator training ratios—represented a collaborative and bipartisan effort between the FAA, National Transportation Safety Board, labor, and Congress.

The ATP requirement (1500-Hour Rule) has led to the safest period in commercial aviation history. We have experienced only one inflight fatality amongst all major carriers. However, it is not uncommon for advocacy groups to petition the FAA or Congress to reduce or water down the 1500 rule when they wish to increase the number of available ATP pilots. The FAA has repeatedly denied petitions to reduce pilot training hours because of the increased risks doing so would represent to passenger safety.

The Southwest Airlines Pilots Association ("SWAPA") opposes reducing or watering the 1500-Hour Rule—including lowering the 1500 total hours or expanding the

simulator hour portion. Doing so would threaten to degrade a safety system that is working remarkably well. However, if increasing the number of available ATP pilots is a goal, SWAPA can offer three shovel-ready solutions to preserve the U.S.'s "Gold Standard" of aviation safety.

RESOLVE TESTING BOTTLENECK

There are four paths to becoming an ATP certificated pilot—the U.S. military with 750 hours, a two-year collegiate flight program with 1250 hours, a four-year collegiate program with 1000 hours, or private flight instruction with 1500 hours. Most collegiate or airline flight school graduates return to either entity after graduation to instruct. They spend approximately 18–24 months to accrue the required hours to achieve their R–ATP/ATP certificate. However, a significant testing backlog often has pilot applicants waiting months to test and advance through their certification rating process.

The FAA authorizes experienced non-government pilots—called Designated Pilot Examiners ("DPEs")—to administer and certify flight examinations of pilot applicants on the Agency's behalf (under 14 CFR 183.23). Unfortunately, there aren't enough DPEs to satisfy demand. The FAA tried to address this issue in some way in 2018 by removing geographical limitations on DPEs and increasing the number of tests per day DPEs can perform. Despite these efforts, however, the DPE shortage persists. As of February 2022, only 942 DPEs exist nationwide. Of those 942, almost half of those DPEs perform less than 50 tests per year.

Congress can increase the new pilot supply to regional and major airlines by increasing the supply of DPE's thereby reducing the training bottleneck. In addition, the 2018 FAA Reauthorization established a DPE Working Group to provide recommendations to address the DPE shortage. The Working Group submitted its recommendations to the FAA in 2021. SWAPA remains neutral on the specifics of those recommendations but encourages all stakeholders to continue their work to address this staffing issue.

REMOVE FINANCIAL BARRIERS TO TRAINING

The average cost per student to an airline-sponsored flight school is $100,000. Additionally, once a pilot trainee graduates from a flight school, they still have to accrue additional hours, which is costly. However, Americans pursuing flight training don't have access to the same loan rates and structures available to traditional college and vocational school attendees. They cannot utilize 529 Savings plans to save for this career path. Additionally, it is not uncommon for the testing backlog to force students to take longer than four years to complete their training. Exceeding this timeframe can trigger problems with the underlying grant and/or loan requirements.

These financial barriers discourage trainees from pursuing an aviation career. There are currently bipartisan and bicameral legislative proposals to resolve these disparities. SWAPA supports these efforts to remove financial barriers to aviation training.

REDUCE SPECIAL ISSUANCE MEDICAL DELAYS

Pilots must receive medical clearance from the FAA every six months for Captains and 12 months for First Officers to remain in the air. If a pilot experiences a health event or medical condition, they must obtain a Special Issuance Medical. Unfortunately, as currently administered by the FAA, the special issuance medical process is beset by extremely lengthy delays that keep pilots grounded in limbo for months to years without resolution.

Pilots can wait several months to years before receiving a determination from the FAA to resolve any special medical flags. In some cases, these bureaucratic delays persist even if the pilot received subsequent medical clearance from their FAA-approved health provider. These delays and lack of transparency keep untold numbers of experienced pilots out of duty well beyond what's necessary for due diligence. SWAPA supports efforts to reform the FAA special issuance medical process to improve transparency, efficiency, and get more qualified pilots back in the air.

CONCLUSION

SWAPA strongly opposes efforts to reduce—or otherwise water down—the current ATP requirements. Undermining the Rule would degrade safety while running a real risk of lowering the pilot supply in the medium-to-long term. Reducing the ATP requirements may provide a short-term boost to the number of pilots initially quali-

fying for hire. However, doing so would lead to a mass exodus of existing flight school instructors and worsen the training bottleneck. Most flight school instructors are pilots working to accrue their ATP-required hours before leaving to join an airline.

The Colgan Air tragedy is a constant Northstar for all stakeholders. Safety can never be sacrificed, even to increase worker availability. Fortunately, there are ways to improve pilot training output without degrading safety. Congress can increase the availability of DPEs, remove financial barriers to training, and resolve special medical delays. SWAPA stands ready to help Congress and the FAA address these crucial issues.

Letter of April 18, 2023, from Robert Rockmaker, President and Chief Executive Officer, Flight School Association of North America, Submitted for the Record by Hon. Rick Larsen

APRIL 18, 2023.

The Honorable STEVE COHEN,
Ranking Member—Subcommittee on Aviation,
U.S. House Transportation and Infrastructure Committee, U.S. House of Representatives, Washington, DC 20515.

DEAR RANKING MEMBER COHEN,

The Flight School Association of North America (FSANA) which was formed in 2009 would like to go on record as fully supporting that the "1,500-hour" rule remain in place with no changes.

The United States has continued to experience the safest 13 years in the history of airline transportation in America in large part because of the "1,500-hour" minimum requirement for pilot training as passed by Congress in 2010.

The 2010 Airline Safety and Federal Aviation Administration Act was the first piece of new airline safety legislation to be adopted in over 20 years, brought about by the crash of Colgan Air flight 3407 in 2009. The accident killed 49 people on board and one person on the ground. The 2010 Act requires airline pilots to complete a minimum of 1,500 hours of flight time under most circumstances.

A deviation from current regulatory practices that have served to produce the safest period of airline travel in the United States since they were implemented represents a major risk to the flying public.

A deviation from the current regulatory practices would result in a significantly higher turnover rate of Certified Flight Instructors (CFIs) at flight schools. This would further exacerbate the industry's ability to train new pilots.

A majority of airline pilots have started their careers as CFIs. The experience they gain from teaching new Ab Initio pilots is priceless due to the myriad of flight experiences that take place in the early days of new pilot training.

Flight school owners and operators have spoken loud and clear that any reduction in the "1,500-hour" rule will create a serious CFI turnover which will hinder the pilot training pipeline due to a lack of qualified pilots to teach new students. The current pace of Ab Initio training would be greatly reduced leading to further pilot supply issues.

Nothing replaces experience and FSANA like all aviation segments has safety as the highest priority. Nothing can come before safety. Creating a quality safety culture is accomplished by never ending focus and improvement and safety is not established by luck. FSANA fully supports that the "1,500-hour" rule remain in place with no deviations.

Thank you very much and we stand ready to be a resource to the committee and appreciate the work being conducted by the committee.

Sincerely,

ROBERT ROCKMAKER,
President and CEO, Flight School Association of North America.

Press Release of April 19, 2023, from Ambassador Sully Sullenberger, Submitted for the Record by Hon. Rick Larsen

Contact:
Carie Ferreira McGrane
(415) 640–3767
carie@sullysullenberger.com

FOR IMMEDIATE RELEASE
April 19, 2023

AMB. SULLY SULLENBERGER DENOUNCES ATTEMPTS TO CHEAPEN PILOT TRAINING

SAN FRANCISCO—Ambassador Sully Sullenberger, who recently served as the U.S. Ambassador and Permanent Representative to the International Civil Aviation Organization, and is best known for successfully landing his disabled jetliner on the Hudson River with no fatalities in January 2009, has long spoken about the need for quantity and quality when it comes to new pilot training—and how we can and must have both. He released the following statement ahead of today's House Subcommittee on Aviation hearing:

> "Airline industry lobbyists and some in Congress are still trying to cut pilot training in half to cheapen and quicken it. That is a dumb and dangerous idea. With the recent shocking airline near misses and close calls, now is absolutely not the time to cut corners. No one would want their loved ones to board an airliner piloted by a crew not able to handle whatever challenges they will face."

Ambassador Sullenberger will be listening to today's hearing—"FAA Reauthorization: Examining Current and Future Challenges Facing the Aerospace Workforce." He is a speaker, author, safety expert, and an ardent advocate for the safety of everyone who flies. His lifelong preparation and leadership enabled him to safely guide US Airways Flight 1549 to an emergency water landing in New York City's frigid Hudson River—an inspirational and iconic moment in modern history. During his tenure as Ambassador to ICAO, a United Nations Specialized Agency, he reasserted U.S. leadership there, tackling the aviation crises involving Belarus, Russia, a Middle East airspace dispute and climate change. He has also testified before Congressional committees several times, as recently as 2019.

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Mr. LARSEN OF WASHINGTON. Thank you.

So, first question is for GAO and Heather Krause. You mention on page 11 of your report, which I think, first off, the report does a good job of outlining the phalanx of challenges that we face and then some solutions for it.

But on page 11, you discuss infrastructure constraints, by which you mean school infrastructure facilities' ability to train students, as well as the increasing demand from traditional aerospace and from the emerging AAM industry.

And I am wondering if GAO has done anything specifically about a study on the AAM industry with regards to the employment opportunities but also the shortage or the dearth of folks who can help that industry as well.

Ms. KRAUSE. Yes. We did some work looking at the projected timelines at this stage for AAM, and as part of that, understanding some of the challenges that the industry faces. And so, one of them is workforce challenges.

The skills, we did explore with stakeholders the types of skills that are needed for that workforce. So, things like increased understanding of electrification and power systems is one example. But the standards haven't been set and the skills are sort of still being developed or determined that are going to be needed for those types of aircraft as those aircraft are being designed and certified. So,

that is kind of driving what would be needed for better understanding what kind of workforce is needed.

Mr. LARSEN OF WASHINGTON. OK. Thanks. And not to be too obvious, but I will be very obvious. Another reason why maybe it is a good idea to increase the authorization levels for section 625, because it is clear from the amount of applications that come in that we are hardly meeting the demand right now.

Ms. KRAUSE. Yes. The range of stakeholders we spoke with had some concerns about the funding levels.

Mr. LARSEN OF WASHINGTON. Yes. Great. Thanks.

Dr. DeVivo, just turning a little bit differently, what actions have you seen as most successful in keeping costs down for students or for helping students?

Ms. DEVIVO. Are you asking about one specific program or just in general about how to keep costs down?

Mr. LARSEN OF WASHINGTON. I am asking you what actions have been most successful in keeping costs down for students.

Ms. DEVIVO. So, I am not sure I completely understand what you are asking in terms of—you mean as an institution?

Mr. LARSEN OF WASHINGTON. I am not trying to be belligerent. It is a simple question.

Ms. DEVIVO. No, no, no. I am just trying to understand.

Mr. LARSEN OF WASHINGTON. It is a simple question about what are the best opportunities, what are the best actions and easiest for students to use in order to keep their cost down for aviation schools, in your experience?

Ms. DEVIVO. Yes. So, it will vary by State. Some States are—in addition to Federal funding, whatever that State is doing in terms of helping to support that student. And I am really limiting my comments to those from low socioeconomic backgrounds. So, any prep that they can do before they get to a collegiate program—and we do everything from aviation maintenance training to engineering programs—so, on the aviation maintenance training side, the rules that just changed after 50 years in September helped us to put the general license in high schools. So, that can help save money. So, then you are only coming to us needing an airframe and a powerplant.

P–TECH programs, if you are familiar with Federal funds that are administered to States, where you can work with a local high school so that a student gets 30 credits of high school and only needs 30 credits at the collegiate level, has an associate's degree. We are doing that in avionics, aircraft electronics. And we find an industry partner. So, it is the local high school, us, and in this case AAR. Now you are only paying for 30 credits of collegiate education.

So, those are a couple of different ways. Having more of the work, the prep work done to the extent that we can in high schools certainly helps in that pathway. The nice thing about aviation is you can be flying from a young age. You can't get certified, but you can at least be flying.

So, when students come to us at 10th and 11th grade, I will say, did you take a demo flight? Start to get a sense of what the career path looks like. You can start to build hours even before you get

to us. Those are some of the options that really help lower the cost for families.

Mr. LARSEN OF WASHINGTON. Thanks. I appreciate that.

And I appreciate it, Mr. Chair. I just wanted to ask some other questions other than the 1,500-hour rule. We are getting a good debate on that, and I think that is great, but the workforce development part of the FAA bill title will be addressing much broader issues as well, and I wanted to be sure to get some other things on the record.

And I want to thank Captain Ambrosi for being our witness here today. Thanks.

Mr. YAKYM. Thank you, Ranking Member Larsen.

The Chair now recognizes Mr. Nehls for 5 minutes.

Mr. NEHLS. Thank you, Mr. Chairman.

Listen, we all understand that pilots undergo frequent and higher levels of testing than most any other high-stakes profession. Pilots who turn the age of 40 are required medical evaluations every 6 months, an EKG every 12 months, and performance tests every 9 months, recurrent training and qualification programs approved by the FAA, and regular flight test performance evaluations.

Pilots over the age of 60 also undergo frequent simulator assessments to verify their continued competence and flight skills. These assessments provide an evidence-based—an evidence-based—measure of a pilot's decisionmaking, reaction time, communication, and overall performance. And there is no better measure of the competencies required for safe and effective flight than simulator assessments, regardless of age.

In 2007, the FAA changed the age of pilots on large carriers from age 60 to 65. Back then, ALPA was against raising the age. They fought against it aggressively. Once it was passed into law and the age was raised to 65, ALPA reversed course and supported the decision to raise the age.

Mr. Ambrosi, are you familiar with the name Captain John Prater?

Mr. AMBROSI. Yes, sir, former ALPA president.

Mr. NEHLS. OK. Mr. Prater was ALPA's president back in 2007 when the age limit was raised to 65. In a speech in 2010, Mr. Prater praised the decision to raise the age and said it has helped with the pilot shortage.

Mr. Ambrosi, are you familiar with his speech?

Mr. AMBROSI. I am not.

Mr. NEHLS. OK. It is my understanding his speech was on ALPA's website last year, and now it can no longer be found.

Mr. Chairman, I would like to ask unanimous consent to have Mr. Prater's speech entered into the official record.

Mr. YAKYM. Without objection, so ordered.

[The information follows:]

Speech of Captain John Prater, Then-President, Air Line Pilots Association, International, Before the Aero Club, July 19, 2010, Submitted for the Record by Hon. Troy E. Nehls

Address By:
Captain John Prater, President
Air Line Pilots Association, Int'l
Before the Aero Club of Washington, D.C.
July 19, 2010

The airline industry is different from any other in the tension that exists between its two missions. On one hand, airlines are treated like public utilities that are expected to provide safe, secure, low-cost transportation to the general public. On the other hand, the airlines are for-profit companies that are expected to make money. Balancing these missions has become complex.

I'm honored to provide the views of nearly 53,000 airline pilots at 38 airlines in the United States and Canada on how we can achieve these seemingly divergent missions. As president of the Air Line Pilots Association, International, I would like to express my appreciation to Bob (Bergman) and the Aero Club of Washington for having me here today for this luncheon.

Whether we are airborne at 35,000 feet above the Capitol or shadowing the Potomac on approach to Washington National, airline pilots have a unique and unrivaled perspective from the flight deck about how regulations and legislation created in this city affect our passengers and cargo, as well as our nation's role in the global air transportation system.

As pilots, our investment in our company is unlike that of almost any other U.S. worker. Our seniority system encourages mentoring so that we can pass along our decades of flight experience to the next generation of airline captains. It positions us to hold safety as our highest priority. It also allows us to say NO when safety concerns rise to the point of conflict with profits or operational metrics. The seniority system should serve to make us career-long stakeholders in our airline, because leaving our company means starting over and essentially destroying the value of our decades of experience.

The seniority system, which has been called our "lead handcuffs," has far too often been used as almost a weapon against us during collective bargaining or Chapter 11 reorganization.

But the safety and stability that pilot seniority systems are designed to create have come under intense pressure in the face of consolidation or other corporate transactions. And many airlines are no longer viewed by airline pilots as career opportunities. In fact, one manager of a large regional carrier has called the abundance of pilot experience on his seniority list the "death spiral" of pilot costs. What a shame that pilot experience is seen as a financial liability instead of an asset when it comes to attracting more business.

I would like to lay out for you today our view of how government policy makers, and industry and union leaders, can offer all of our constituents a more stable future.

First, we must take a step back and look at the state of our profession and of our industry. In the years since 9/11, airline pilots and other airline employees have, of course, as you all know, been besieged by carrier bankruptcies and had to endure staggering concessions, brutal pension terminations, and widespread job losses.

Moreover, the last 30 years of relatively low barriers for entry into the airline industry, widely available capital, and the increasing ability to reach and sell products to consumers via the Internet have made it much easier for start-up airlines to come into this industry.

Unfortunately, this ease of entry has led to the start-up of new airlines that are often under-capitalized and ill-prepared to execute a long-term business plan. As these airlines enter the market, they have a dramatic effect on pricing and force their established competitors to price irrationally in order to compete.

Over time, when new entrants file for bankruptcy, go out of business, or merge, as they often do, the established airlines have absorbed huge losses, often entering reorganization themselves.

The industry as a whole suffers from these poorly performing new-entrant airlines, a result that clearly works against the long-term goal of a safe and stable air transportation system.

As one competitive response, the name-brand airlines have increased the practice of outsourcing much of their domestic and North American flying, which has created a new airline business model. Whether this model is called fee for departure, prorate, system extenders, or regional airlines, it has succeeded in lowering overall

pilot and labor costs, but it has eliminated the many benefits of retaining experienced and loyal, career-minded employees who now struggle to earn enough to provide for their families.

Where do airline pilots stand in this new scenario? Many of you here today witnessed the shock expressed by members of Congress and the news media when it was revealed that pilots flying 30- to 90-seat airliners can expect to earn as little as 16,000 or 17,000 dollars a year.

In addition, this frenzy to cut costs has prompted many airlines to push pilots to work the maximum number of hours that regulations allow. Coupled with minimum staffing of pilots and obscene scheduling practices, this focus on productivity and cost-cutting forces pilots to spend many more hours on duty, whether it is measured by day, month, or year.

This reality not only affects the pilots of today, it also influences the pilots of tomorrow. The cost of the basic education needed to become an airline pilot can easily approach 200,000 dollars or more, and so the prospect of spending such a sum to land a piloting job earning less than 20,000 dollars a year simply doesn't make sense, not to us, not to anyone.

Today's reality does not bode well for our industry's ability to attract the most talented individuals to my profession. The recession that took place in this country during the past two years, along with the change in the mandatory pilot retirement age in 2007, has buffered us against a true pilot shortage.

However, the recent economic momentum and approaching massive retirements mean that more qualified airline pilots will be required than are willing to work for the bankruptcy-driven wages and quality of life that we witness at far too many airlines today.

Yet, in the face of all of this, I am proud to say that airline pilots stand as consummate professionals who safely fly millions of passengers and millions of tons of cargo every day.

So, what do pilots in the cockpit and passengers in the cabin need from Washington if we are to revitalize a stable, safe, and profitable industry, now and for the future?

ALPA believes the plan must be set on a five-point foundation. We need to:

- Create a national-level aviation policy that ispart of a U.S. transportation policy;
- Establish a single, high level of safety andsecurity for ALL passenger and cargo airlines;
- Develop and maintain the best trained, mostcompetent pilot workforce in the world;
- Modernize the National Airspace System;and
- Forge a U.S. international aviation policy that provides an effective balance among U.S. economic, security, airline, passenger, and worker interests.

The first of these five points is ensuring that our national policies promote opportunities for U.S. airlines to prosper, create good jobs for U.S. workers, and allow our companies to compete effectively and profitably with foreign airlines.

Identifying the policies, or lack of policies, that form barriers to stability is the first step. National polices must be scrutinized and reset if they do not advance the goal of stabilization.

One example is the current taxation structure. Incredibly, you have heard it before and you will hear it again, airline tickets continue to be taxed at least as heavily as tobacco and liquor in this country. This is outrageous, and I think we can all agree that Congress must correct it.

Another example is fuel speculation. While prices are relatively stable now, dramatic swings in prices and high costs add significant stress to the industry and make long-term planning almost impossible. This, too, must be rectified. ALPA was proud to partner with the ATA on related provisions of the financial legislation that is now before the President and which we hope will address this concern.

The second point of our foundation is the need to ensure that the airline pilot workforce continues to be the best trained, most competent in the world, and that pilots uphold and maintain the highest standards of professionalism.

Given a decade of concessions and the "race to the bottom" pattern in the regional segment of the industry that I mentioned earlier, we also must position our industry to attract and to retain the highest-caliber candidates.

For most of our history, the U.S. airline industry has been able to count on a steady supply of military-trained aviators who were eager for a full airline career following their service to our nation. Those days are over.

Today, a majority our pilots come from the civilian and university programs, and, unless our industry offers pilots a better future than it does today, our airlines will soon face a severe problem.

The third of our five points? We need to ensure a single, high level of safety and security for all airlines, regardless of whether their pilots carry passengers or cargo or what type or size of aircraft they fly.

A foundational element of this single level of safety must be science-based flight-time and duty-time limits and minimum rest requirements and to make sure that they apply to all types of flying.

The cooperation among ALPA, government, and industry partners through the formation and the work of the Flight/Duty Time Aviation Rulemaking Committee set the pace for progress toward the common goal of a new, updated set of regulations based on science.

This initiative by the FAA and the DOT must finally get airborne. While we understand this is a comprehensive and very complicated regulation, I do hope the September forecast is met.

The failure to complete the FAA reauthorization continues to put a hold on many critical safety enhancements. The versions of the reauthorization currently under consideration by the conferees will address many of ALPA's safety priorities, including policy improvements in the pilot fatigue area, weather research on volcanic ash and airframe icing, and runway safety.

The FAA reauthorization also makes an important down payment on implementing NextGen, which is the fourth element in ALPA's policy plan for a stable U.S. airline system.

As new technologies emerge, the pace of change in our industry highlights our outmoded aviation rulemaking process.

The current process is slow and cumbersome, and it attempts to regulate the safety of an industry that is becoming increasingly agile. When a risk is identified and a solution created, regulations can literally be years in the making.

The result is a patchwork of outdated rules that are supplemented by government recommendations, manufacturers' bulletins, and industry best practices, which are, of course, not mandatory or enforceable if an airline management chooses not to comply to keep a low-cost advantage over those that do.

I fully support the FAA's current charter of a new Aviation Rulemaking Committee to address the qualifications and training for second-in-command pilots. I have appointed two ALPA members to participate on the ARC, and I hope that my concerns regarding regulatory delays are not borne out in this critical safety matter.

Finally, the fifth point. Our country needs to establish and maintain a U.S. international aviation policy that provides an effective balance among U.S. economic, security, airlines', and, again, workers' interests.

ALPA stands in solid support of the current U.S. foreign ownership and control rules. We urge their full enforcement. These rules are rooted in basic national security considerations, especially the need to ensure that U.S. aircraft are available in times of national emergency.

The United States needs to ensure that our carriers are able to continue to survive and grow in the international arena. ALPA is offering suggestions to the Future of Aviation Advisory Committee that we believe will help achieve this objective.

As I present ALPA's five-point plan for a safe and stable airline industry, I do feel optimistic because the U.S. and global economies are showing signs of growth and recovery. While issues outside of the industry still loom as potential threats, one thing is clear: the health of our industry corresponds and contributes to the health of our economy. We must do all we can together to foster it with federal initiatives that protect and provide for the health of the airline industry.

Another reason for optimism for me is the current Administration. We are now working with a U.S. government that engages union and industry leaders when searching for solutions.

The Obama Administration has set a new tone of working with ALPA on the safety, security, and labor relations issues that matter most to our passengers and to our profession.

In a related area of government policy, negotiating and enforcing contracts under the Railway Labor Act only works when both bargaining parties are treated fairly and equally. When the National Mediation Board creates uncertainty about the steps it may take in mediation, both parties are motivated to bargain earnestly to reach a final agreement. The NMB has shown that it means business in efficiently moving toward closing current negotiations. Bargaining parties that fail to act responsibly can expect consequences.

This change has produced results—in the form of new working agreements—over the past year.

ALPA pilots at Alaska and Hawaiian Airlines have recently approved new, positive contracts that have rewarded our members, produced profitable companies, and begun to stabilize labor-management relations.

Both of these management groups are to be recognized for their willingness to invest in their employees. I have given my commitment to help them succeed in this difficult business.

Unfortunately, one ALPA pilot group faced a management that tried a different approach. The management at Spirit Airlines refused to acknowledge the enormous contribution its pilots made to the company's survival in hard times and to its prosperity during recent years.

After four years of fruitless contract talks, the National Mediation Board released both pilots and management from mediation on May 12. The release triggered a 30-day cooling-off period that expired at 12:01 a.m. on June 12. After two deadline extensions and a full-out effort failed to reach an agreement, Spirit pilots withdrew their services.

Following five days of trying to operate an airline without pilots, Spirit management reached a tentative agreement with ALPA that includes improvements in pay, benefits, and work rules that reflect the pilots' contributions to the company's success. Should the Spirit pilots ratify this tentative agreement, and if Spirit management demonstrates its willingness to now move forward with a consensual relationship with their ALPA pilots, they, too, will have my commitment to assist in making their company a success.

I hope that these three examples illustrate my point: those managements that work with ALPA stand a far better chance of succeeding than those that don't.

With nearly half of ALPA's 38 pilot groups currently in or approaching contract negotiations, I hope that airline managements understand how important it is to find ways to reach agreement. Pilots at Trans States, AirTran, Pinnacle, United, and Continental are entering critical phases of negotiations.

I'm optimistic that outcomes at these companies can mirror the recent positive results that I just mentioned.

This tenet is also true for the consolidation and transactions both real and forecast at several airlines. The pilots at Colgan, Compass, American Eagle, Pinnacle, Mesaba, and Trans States are their companies' most valuable and vested assets.

In these and any future transactions, our involvement every step of the way is essential for the long-term success and, I daresay, survival of the airline.

On another note regarding the Obama Administration, ALPA applauds Secretary of Transportation Ray LaHood for establishing the advisory committee and for selecting ALPA's director of economic and financial analysis, Ana McAhron-Schulz, to serve among its members. The Committee and its work are important acknowledgment that this industry and our workers cannot be overlooked or underrated as a cornerstone in the global economy.

Our airline industry is undergoing a critical transformation right now. The decisions we make in taking on the challenges we face today will determine the opportunities we have for tomorrow.

The promise of new national policies and collective bargaining agreements that will enhance safety as well as pilots' professional lives is encouraging. These improvements will make a difference for pilots flying the line now, and they will help restore our profession as we seek to attract qualified candidates to become the airline pilots of the future.

At ALPA, we are hopeful about an improving economic outlook, a government that is willing to listen to labor's views, and managements that are committed to understanding and working with organized labor. Together with the five-point foundation I laid out, these developments will foster a safe and stable industry.

Whether you experience it from aboard an international long-haul flight passing 35,000 feet overhead on your way to Europe or on the river approach to National, this city, and indeed each of us in this room, has a tremendous capacity to contribute to a safe and stable airline industry, but we must also resolve to ensure that the needs of all stakeholders are recognized.

I hope that all of you will join me in a renewed commitment to strengthen our industry in every area—safety, security, and labor relations. Our passengers, cargo shippers, employees, shareholders, and economy depend upon it.

Thank you again for the opportunity to be here today.

Mr. NEHLS. For all my colleagues here today, I need to clarify one thing. The aviation industry—and we know it—is the safest in history, in aviation history today. And I think it is the remarkable work done by the FAA, as well as the airline carriers, but understand this: Regional carriers support raising the age from 65 to 67.

Mr. Ambrosi, a part 125 carrier can haul 20 passengers. A part 135 carrier can haul 30 passengers. And some of these aircraft operated by the 125s and the 135 carriers can be as large as a 737, a 747, hell, even a 787. Is that correct?

Mr. AMBROSI. That is my understanding.

Mr. NEHLS. Yes, that is correct.

Do you believe the 125 and 135 carriers are operating safely, yes or no?

Mr. AMBROSI. Sir, I don't represent those airlines.

Mr. NEHLS. Folks, these carriers can hire pilots to fly past the age—up to 70 years old.

Do you think it is fair—and nobody in this room—do you think it is fair that the millionaires and the billionaires in this country are allowed to fly NetJets? And all these big private airlines, they got NetJets. They are flying, having their good time on their private jets, right? And they get the most experienced pilots to fly while average Americans don't.

NetJets and them, they are stealing these pilots from the part 121s. They are stealing their pilots at the age of 65, because you can't fly anymore for the part 121. You can't fly for United and American once you turn 65. NetJets and all these private carriers, they just love it, because they are just taking them. They got a guy with 25,000 hours in the cockpit. They love it.

A sports team, folks, a sports team can fly a part 125 and a 135. Like the basketball team. Boston may have to fly to Atlanta, the basketball team. Cleveland is going to fly to New York. The playoffs are going on. These teams are worth billions of dollars, and yet they are confident that the guy in the cockpit could be up to 70 years old, even higher. The wealthy elites out of Hollywood flying these private jets, they can have a guy get in that cockpit and he can be 70 years old, but yet we are telling the major airliners, when you turn 65 you are out of here.

Are part 125 and 135 pilots less safe than the part 121 pilots, Mr. Ambrosi, yes or no?

Mr. AMBROSI. Sir——

Mr. NEHLS [interrupting]. Answer yes or no. Are they safer than—are they less safe than the 121 pilots and do you have data that would support it, yes or no?

Mr. AMBROSI. They operate in a different world.

Mr. NEHLS. Folks, this is my point: Large airliners are forced to retire at the age of 65 because of an arbitrary rule passed by Congress. The pilot age was put into place in 1959. In 2007, they overwhelmingly raised the age limit to 65.

I tell you what. I ask the committee to support my bill. Let experienced pilots fly, raising the age from 65 to 67. I highlighted the health and physical fitness requirements. They are the same. Let's show support for the regional airliners by raising the age 65 to 67. The regional airliners are asking for our help, and it is the right thing to do.

Ms. Black, I will fight like hell to get this commonsense approach and increase the age 65 to 67 in the FAA reauthorization.

I yield back.

Mr. YAKYM. Thank you, Mr. Nehls.

The Chair now recognizes Mr. Johnson for 5 minutes of questions.

Mr. JOHNSON OF GEORGIA. Thank you, Mr. Chairman, for holding this hearing, you and the ranking member. And I want to thank the witnesses for appearing today and for your testimony.

Since the Wright brothers first took flight on December 17 of 1903, the aviation industry has soared to heights that the Wright brothers could not have imagined.

Aviation today is an essential component of America's global leadership, and Congress must stay diligent in ensuring that the aviation industry continues to set the gold standard for the world, thus ensuring continued economic growth in trade, business, and tourism.

And it is critical to understand that the changing American demographic requires that all sectors of the aviation industry reflect the diversity that will continue to emerge, because without pipelines of opportunity aimed at currently underrepresented demographics, the shortage of workers in the aviation industry overall will be exacerbated.

Captain Ambrosi, last month I introduced the Minorities in Aviation Education Act which, if enacted, would take a critical step towards diversifying and growing the aviation industry workforce by creating a grant program geared towards strengthening the pipeline for the entry of more women, people of color, and individuals living in rural areas into the aviation industry.

One of the largest vocational flight schools estimates that it costs $96,995 to become a pilot for those with no previous flight experience. When you consider that people of color, women, and those living outside of urban areas are historically less wealthy, which means that they lack the resources necessary to become pilots, licensed pilots, when you consider that fact, it is no—there are some pieces in the puzzle that become clear.

Can you elaborate on the financial and other challenges that many individuals, primarily minorities, face when trying to enter the aviation industry as pilots?

And also, some airlines won't consider hiring a pilot who is not a college graduate. Is it your opinion that a college degree is a reasonable requirement for those seeking to become a commercial airline pilot?

Mr. AMBROSI. Thank you, sir, for the question. First and foremost, I agree. Flight training has gotten so expensive, I don't think I would be here today if I was going through the process today. And so, I can completely understand how tough it is for folks of a different demographic.

It is essential that we support, provide student loans for flight training programs, establish grants and support building out aviation programs at Historically Black Colleges and Universities and other areas where minorities can be served, increase funding for the Federal development workforce grants, and make sure that we are out there outreaching to women in aviation and we are doing—it is an all-of-the-above approach. It is not just one or the other. We should be doing all of the above.

Mr. JOHNSON OF GEORGIA. And what about the requirement for a college degree?

Mr. AMBROSI. I apologize. So, it is my understanding that most of the airlines have subsequently removed that. At a time when there was just an absolute surplus of pilots, both in the civilian ranks and coming out of the military, it was very hard to get hired at the airlines when I was going through the process 25 years ago. It was a thing they added to it just to say, hey, OK, one more item to add to the list of narrowing pilots down. But I believe that most of the U.S. airlines have removed that requirement, sir.

Mr. JOHNSON OF GEORGIA. Thank you.

Dr. DeVivo, your written testimony stated that 80 percent of your students are from underrepresented backgrounds, and most are first-generation Americans and first-generation college students. Also, 21 percent of your most recent incoming class are women. You also stated that 72 percent of your students worry about having enough money to pay for school, and 20 percent ran out of money six or more times in the past year.

Can you speak further about the possible solutions that Congress can consider in the upcoming FAA reauthorization?

Ms. DEVIVO. Yes. Thank you very much for that question. And they are an awesome population. Queens is the most diverse county in the country, and we reflect all the amazing immigrants who have come to this country. And that has been true for all of our 90-year history.

As I put in my testimony, there are several Federal grant programs. So, doubling Pell is key to this. And that is true for every student I serve, but many students across this country who could use greater support. These are the neediest students that are served by Pell.

I am also fortunate to be from a State that is quite generous in terms of its State support. So, that is helpful. The State support is often key to helping students get through the program of their choice.

And then there are other ways. The Flight Education Access Act will specifically help flight students. Oftentimes, our students don't qualify for the loans, like parent PLUS loans, which offer much better interest rates, because either their parents don't have a credit background or their credit scores are not good enough to get a loan. So, this would actually help provide subsidized and unsubsidized loan rates at interest rates that are much better. And then they could qualify for income repayment, which would be more affordable as well.

Mr. JOHNSON OF GEORGIA. Thank you, Mr. Chairman, for your indulgence. I yield back.

Mr. MOLINARO [presiding]. Thank you, Mr. Johnson. Not a problem. Thank you, Mr. Johnson.

I would now like to recognize Mr. Stauber for 5 minutes.

Mr. STAUBER. Thank you very much, Mr. Chair.

And to all the witnesses, thanks for your testimony. And we appreciate being able to say that flying the skies is the safest form of transportation. I have the privilege of doing it at least twice a week.

Mr. Ambrosi, can you speak a little more about some of the accessibility issues to careers in aviation that you have observed?

Mr. AMBROSI. Yes. Like I said previously, sir, the cost has gotten to a point where I don't think I could be in this position today. So, we need to address that, and we need to address bringing more people into this great profession.

Being an airline pilot today, now that we are in a post-pandemic environment, and we are bringing up pay and working conditions to where they should be, this is a great time to be an airline pilot, and we need to make sure that access is out there for everybody.

So, like I said, Federal student loans, grants. Let's make sure that we get out there and get the resources to Historically Black Colleges and Universities and minority-serving institutions, so that they can get the resources they need to encourage our next generation of pilots, mechanics, flight attendants, everybody. Get involved in this great profession.

Mr. STAUBER. And a followup: Would allowing the FAA-certified commercial pilot and aircraft maintenance technician schools to qualify as an expense for existing 529 plans lower this barrier?

Mr. AMBROSI. I think that is a spectacular idea. We would support that 100 percent.

Mr. STAUBER. I am grateful to Congressman Collins for introducing the Aviation Workforce Development Act to help make aviation education more accessible. And as a cosponsor, I look forward to championing the bill across the finish line during the FAA reauthorization.

Dr. DeVivo, in your testimony, you indicate that legislation, like the National Center for the Advancement of Aviation Act, could help create greater awareness of the aviation sector, especially by young people. Mr. Carson and I plan to reintroduce the bill next week.

Could you elaborate on how the NCAA could help with youth engagement?

Ms. DEVIVO. Yes, absolutely. So, one of the key ways that we found as part of the Youth Task Force was there is no one place to get good information about how to get to a career in the industry.

So, let's say you go to Oshkosh and you get an EAA free Eagle Flight, right? And then what do you do? If there were resources online that maybe connects you to your local Civil Air Patrol chapter or Women in Aviation chapter, and then that leads to a Scouting badge, and then you take a certain set of courses in high school and that leads you to collegiate and technical training programs.

It can be very mysterious. And the National Center would actually help in terms of a website that would create day in the life, videos about all the different careers, what the pathway looks like, what the pay looks like. How do you get there? How do you finance it? It would take all the mystery out of it for families.

Mr. STAUBER. I agree with you. I think that the more we can let the public and our youth know about the aviation careers and how awesome they can be and how exceptional they are, I think we can help with that workforce issue. And I know that this committee, in a bipartisan fashion, as Mr. Johnson stated earlier, we want to help you with that, and we are committed to doing that.

I appreciate the opportunity to work with my colleagues to improve the workforce pipeline and inspire more people to work in

the aviation industry during the FAA reauthorization. But the truth of the matter is, we must stop disincentivizing a whole generation of able-bodied Americans from working. Now, nearly every industry is suffering from workforce shortage. We need to return to a society that values the dignity of work and rewards effort. Only then will we see the real changes we all desire.

Mr. Chair, I yield back.

Mr. MOLINARO. Thank you, Mr. Stauber.

And now for 5 minutes, Mr. García.

Mr. GARCÍA OF ILLINOIS. Thank you, Chairman. And thank you to all the witnesses this morning.

My first question is to Captain Ambrosi. As you stated in your testimony, the number of ATP certificates issued each year between 2017 and 2022 increased by more than 100 percent, which is great. But the flight schools across the country are running at maximum capacity.

First officers complete initial training and then have to wait for a check airman to perform their initial operating experience. Once online, the first officers are underutilized due to the imbalance in captains, first officers, and check airmen. These problems, in addition to the mass early retirement during the COVID–19 pandemic, contributed to the bottleneck in the training pipeline that hinders a carrier's ability to effectively utilize pilots.

So, my question is: In your opinion, what can Congress do to help enhance your training capacity and to eliminate the bottlenecks in the training pipeline?

Mr. AMBROSI. Well, sir, thank you for the question. The system is working. The pandemic—to the retirement piece, many airlines did early-out retirement packages, because they didn't know that three rounds of Payroll Support Program. And thank you very much to the Congress for supporting the aviation workforce. Many pilots retired.

We are catching up on that wave, because those retirements are—so, they were basically borrowing from the future and those retirements are down. So, the retirements over the next 2 and 3 years will be significantly less than they would have been. So, that is going to help us.

The training backlog, it takes a long time to train a pilot at an airline, and that is a good thing, because of the safety record we have. So, we are getting caught up. All those people that were bumped down are now training back the other direction, and the airlines will be in a far better place than they were.

As far as at the regionals with the captains leaving and they have first officers, it is reported that some of the regionals, the better paying and working condition airlines, they have classes full into the next year. So, the captains are leaving. Captains used to stay in place largely and wait for a major partner and go to a legacy partner. The pay and working conditions have come up at the middle airlines so well that now these pilots are also jumping to those airlines and then maybe jumping again. So, it is creating—though some of the numbers are inflated, because they are making two stops on their way to an airline.

So, again, we are catching up on that. The regionals have stepped up their pay and benefits to try to keep some of those pilots there. And, again, that training backlog is resolving itself.

Mr. GARCÍA OF ILLINOIS. And what can Congress do, if anything?

Mr. AMBROSI. It is going to resolve itself. I don't think any action is required, sir, other than, like we talked about on getting more people of diverse backgrounds interested in aviation. The pipeline is full. Let's make that pipeline more diverse and have every pilot, have every demographic represented.

Mr. GARCÍA OF ILLINOIS. OK. Thank you, sir.

And, Ms. Black, how are your member carriers planning to right-size staffing to ensure the effective utilization of the pilots that you have or hire?

Ms. BLACK. I couldn't hear one part of your question. Right-size what? Can you repeat that, please?

Mr. GARCÍA OF ILLINOIS. To right-size staffing to ensure the effective utilization of the pilots that you have or that you will be hiring in the near future.

Ms. BLACK. OK. I want to speak to the broader situation that is happening. I agree that we do have a pronounced shortage of captains. But to put that in a proper perspective, we have a shortage of all pilots. But first officers can't fly without captains, and during the pandemic, they flew a lot less.

Actually, the daisy train of upgrades and downgrades that we see at the major airlines are not happening at the regionals, but we did lose a lot of our captains and captain-ready first officers. The one thing that will slow that down right now is raising the age for retiring pilots so that it slows attrition from the majors.

We did see more jumping around earlier after the pandemic. That has stabilized somewhat, going to the low-cost carriers, then to the mainlines. Pay and benefits have improved across the board.

But regional airlines are and will be the career entry portal for the industry. That is not new. Larger airlines can offer a bigger airplane with greater revenue capacity and more advancement to bigger and bigger aircraft, just like that happens at the majors. We won't stop that attrition, but we need to better manage it. And the retirement age at 65, moving that to 67 gives us about 8,000 more pilots that will stabilize some of that attrition in the next 2 years.

Mr. GARCÍA OF ILLINOIS. Thank you very much. Mr. Chairman, I yield back.

Mr. MOLINARO. Thank you, Mr. García.

And for 5 minutes, I recognize Chairman Graves.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Chairman, I appreciate it.

Ms. Krause, thank you for being back. I think if you testify one more time, you get a free cup of coffee. I appreciate you being here and always appreciate the input you provide to the committee.

Look, I am not a math whiz, but I am looking at numbers, and I am looking at some of the data that you have produced. And so, if I am understanding all this correctly, that FAA is predicting that the number of pilots holding an ATP, an airline transport pilot certificate, to increase by about 30,000 over the next 20 years, which is a 16-percent increase, right?

So, then, over the same period, they have projected that passenger enplanements are forecast to grow an average of 4.9 percent a year, or a 98-percent increase over the same period of time. U.S. mainline carrier fleet is forecast to grow from 3,132 to 5,532, a growth of 3.8 percent per year, which converts to a 76-percent increase.

All right. So, I am going to say it again. I am not a math whiz, but I am looking at a 98-percent increase in passenger enplanements, a 76-percent increase in airplanes. Yet, a 16-percent increase in ATPs, or pilots.

Am I missing anything or do we have a pretty significant disconnect?

Ms. KRAUSE. Yes. Some of the difference is a little bit in how the forecasts are done. And also, when we have looked at FAA's activity forecast, like the enplanement ones that you were mentioning, they have consistently been overestimated, so, overestimating greater demand, because they are unconstrained in that they don't take into consideration things like, is this growth impacted at all by things like airport capacity.

And so, there is some difference there as well as the pilot supply numbers then are projecting off of historical and other data. So, that explains it a bit in terms of the differences.

Mr. GRAVES OF LOUISIANA. But safe to say that, even if you were to include margins of error and others, that we have got a problem moving forward?

Ms. KRAUSE. I mean, I think this industry and the growth of this industry is really dependent on the growth of the workforce. So, I think that is something that is important to focus on.

Mr. GRAVES OF LOUISIANA. So then, when you add in the fact that we are looking at advanced aviation systems, you have got advanced urban mobility, even remote piloted vehicles, that doesn't help, right? I mean, that just further exacerbates the challenges that we are looking at moving forward.

Ms. KRAUSE. That is exactly what we heard when we talk to folks and a range of stakeholders about advanced air mobility and some of the challenges that they face, which is some of these same workforce challenges that the traditional aerospace sector faces. They will also face that, in addition to new skills that these workers will need.

Mr. GRAVES OF LOUISIANA. Great. Thank you.

Ms. DeVivo, in your testimony, you indicated that the single largest hurdle to becoming a pilot is the resources. And I want to thank Mr. Collins jumping in as a freshman and working on solutions to this issue. He has legislation to help address this, and I certainly appreciate him jumping right in in the first few weeks and coming up with solutions.

But how would expanding the use of simulator technologies potentially affect the financial challenges? And I am curious if you could just talk on the safety side as well, which is obviously really critical. Could you respond to that, please?

Ms. DEVIVO. Yes, absolutely. So, part of the reason why the task force recommended this is because simulator time is a lot less expensive than flight time. And if you are not flying consistently—I am talking three times a week—it will cost you much more, be-

cause you have to repeat the last thing because you are just not—well, you know, you are working on your—this idea of being able to consistently fly is really important.

If you were to expand the number of simulator hours that were available, then students could be practicing at a much cheaper rate, which makes that flight-hour in the plane that much more efficient.

So, we were not trying to suggest a change at all in the number of hours to achieve certification, just the efficiency of getting to that certification and not having to require so many hours in the plane.

Mr. GRAVES OF LOUISIANA. Thank you.

Ms. Black, very quickly: Do you think that your member companies would—if we were to raise the simulator hours, do you think that you could actually improve safety? Do your member companies believe you could actually improve safety?

Ms. BLACK. Yes. Thank you for the question. We don't think so; we know so. It comes down to how that time is spent. When we talk about having more or less, it is really important that we ask, more of what?

And when we are allowing our pilots to qualify primarily through hours-based pathways, we don't know what they are doing, but what we can see that they are doing is flying in light aircraft in fair weather. We know exactly what they are doing in a simulated program, and so, that increases the level of safety substantially.

Mr. GRAVES OF LOUISIANA. Thank you, Ms. Black.

Mr. Chairman, I yield back.

Mr. MOLINARO. Thank you, Mr. Graves.

And now, for 5 minutes, I recognize Ms. Scholten.

Ms. SCHOLTEN. Thank you so much, Mr. Chair.

And thank you to all of our witnesses for being here today. Workforce development in the aviation and aerospace industries is a key priority of mine in this year's FAA reauthorization. I appreciate the opportunity to hear from all of you about the challenges and also the opportunities in this sector.

Gerald R. Ford International Airport, one of the major airports in my district, has a unique arrangement with the West Michigan Aviation Academy, a school that is located right on the grounds of the airport and focuses specifically on creating graduates who can go on to work in this field. It is really remarkable. We invite all of you to come out and visit it sometime. We are so proud of it.

Getting more youth in the industry will be critical to maintaining our competitiveness in the years to come, as we have talked about. We talked about changing some of the culture around education and training here.

I recently introduced a bill that changes the way the census tracks higher education from not only recognizing 2- and 4-year college degrees but certificate and training programs like this one.

My first question is for Dr. DeVivo. Can you please elaborate on your experience as chair of the Youth Access to American Jobs in Aviation Task Force? And what recommendations specifically do you have for Congress to take immediate action for implementation and guiding this through the implementation process?

Ms. DEVIVO. Yes. So, it was an awesome 2 years working with 21 members from trade associations, industry, educators, nonprofits, all doing really good work. And we knew we were not going to invent the next greatest program. It had already been invented. The idea was how could we scale it.

And so, what we tried to do was identify the major barriers and then provide solutions. So, the two biggest barriers are awareness and finances, especially to underresourced and underrepresented communities. And if they knew about the opportunities, which are transformational—I can attest to that at my institution—that more people would pursue it, right? But because they don't have an uncle, brother, somebody in their family in the industry, they don't know about it, right?

So, we tried to give both very actionable, put more resources in libraries, all the way to: Could we have a national aviation scholarship program? I think the areas that FAA reauthorization could really help with was: The conversation can't end with our task force or the women's board, which I hope you are familiar with as well.

This idea that we need to keep the conversation going, but not just at the national level, but also to do it at the regional level as well. So, we have proposed: use the nine regions of the FAA, use the AVSED, the Aviation and Space Education office. They have representatives in each district. Put together industry, higher ed, training programs, nonprofits. Let's at least start to share resources, share students, and Boys and Girls Club, Scouting. Get all of us in the room talking about how we serve our regions.

Then have whoever, have a representative go to a National Advisory Council that would look at metrics of success and make sure that that information was always being fed back to the FAA.

Around finances, it is the Flight Education Access Act. It is about doubling Pell. Those kind of things that will really help change the trajectory for underresourced and underrepresented communities.

Ms. SCHOLTEN. Yes. Thank you. That was very insightful and thorough. I appreciate it.

I have a followup question for Captain Ambrosi. Earlier, we were talking about multiple ways to continue to expand our workforce. And I wanted to ask you, do you think it is wise to raise the retirement age to 67?

Mr. AMBROSI. So, thank you for the question. The European regulators have studied this, and they have recommended against it. So, the Europeans have studied the decline with age and are against it.

The current limit in ICAO internationally is 65. The difference last time when we were at 60 going to 65, ICAO was 65. So, going to 65 instantly got you 5 more years of airline pilots. In today's world, that is not the same, because going to 67 will result in every pilot that flies internationally outside the U.S. will have to retrain on domestic-only equipment. The airlines will have to build schedules that result in those pilots only flying domestically.

This is a major cost burden. Not only will it do that for the airlines and create more headache for them, for pilots who choose to stay, you will also have the issue of taking training slots in a much-needed training backlog for those pilots to train going down

and then leave 2 years later, which is a slot that someone that could do the next several years for that company in that position.

Ms. SCHOLTEN. Thank you.

Mr. MOLINARO. Thank you, Ms. Scholten. I appreciate that.

I now would like to just recognize myself for 5 minutes. And thank you all for testifying today.

I know that we have covered these topics ad nauseam this afternoon. Is it afternoon yet? Today. I have made addressing the aviation industry workforce issues and overall workforce shortage, I have made the Workforce Development Grants a principal priority for me as we consider FAA reauthorization and, of course, in an effort to seek increased funding.

I would like to start with you, Dr. DeVivo. And I know that you kind of have spoken to this several times already, but just to reemphasize. I know that you generally agree with the desire to increase funding and the Workforce Development Grants. Could you just speak a little bit more as to the benefit to advancing the workforce development and addressing the shortage within that pipeline?

Ms. DEVIVO. Yes, absolutely. And I will say that my institution was fortunate to get one of those grants on the pilot side, and we are actually doing uncrewed aerial systems work, so, remote pilot work, which is really exciting.

The issue is, is that $10 million is clearly not enough for the whole country, right? And we would really love to see that funded at $50 million. At the same time, please help give the FAA the operational funding to oversee the implementation of those grants.

I think it was a bit of a challenge. And if we were to move from $10 million to $50 million, I think they would need some more operational help.

Mr. MOLINARO. In my previous life as a local elected official, we built an experiential hangar and training program in partnership with the community college. The grant became very, very critical. We know the value, and we know the benefit.

I represent a portion of the State of New York with smaller regional airports, in particular Ithaca and Binghamton, New York, where, sadly, we have seen, certainly because of workforce issues and others, a decline in both capacity and who takes advantage of or makes use of those particular airports.

In my short time on the subcommittee, I have become a bit more interested and focused on advanced air mobility, AAM, with the understanding that the technology itself and the advancement of AAM could provide greater access to those regional airports and perhaps, in fact, revitalize them and create greater connectivity with larger airports.

Ms. Krause, in your testimony, you talk a little bit certainly about your involvement with industry stakeholders in the AAM space and specifically future constraints to expansion. Could you just touch on those constraints and perhaps how Congress might confront those within the FAA reauthorization?

Ms. KRAUSE. Yes. I mean, we heard a number of challenges when it comes to the development of AAM industry. First and foremost is getting aircraft certified. So, that is something that the FAA has been working on. That will help sort out some of the other chal-

lenges that certainly are faced, including workforce. Then you have a better sense of the type of skills that you may need for those workforce.

Other issues that we have heard when we have done this work is just developing, having the markets there to support it and the, kind of, marketability of the technology. So, yes, there are a number of things that are stalled, because it is still developing that, kind of, start with the certification of the aircraft.

Mr. MOLINARO. Thank you for that. I just emphasize, AAM provides, I think, an opportunity to bring back to life some of these regional airports that, frankly, can provide really good connectivity.

Captain Ambrosi, as I came in you were talking a little bit about steps that we could take certainly to expand access and enhance access to pilot education courses, et cetera. Could you reemphasize this concept of making use and qualifying expenses under the 529 savings plans, and perhaps that as a tool might break down some financial barriers? And, again, I recognize that we have touched on some of this already.

Mr. AMBROSI. Yes, sir. Thank you for the question. As I said previously, I think it is an all-of-the-above approach. So, I think the 529 is a great idea. I think Federal student loans for flight training. Other professions have access to these loans. I don't know why our profession is any different. So, we should certainly open the doors.

As I said, funding for Historically Black Colleges and Universities, minority-serving institutions, an all-of-the-above type approach. This is a great—I say it all the time, but this is such a great profession. Let's figure out how to open the doors for everybody. The pipeline is full. We don't have a problem attracting people, but we need to attract everybody. This needs to be an all-of-the-above approach.

Mr. MOLINARO. I appreciate that. And I think we generally all agree. This is an area and a space that, quite frankly, if we get this right, can really unlock employment opportunities with good-paying, solid jobs, long-term investment. And I just hope that we make it a priority in reauthorization and that we focus on breaking into communities that often don't have access to what will be tremendous work opportunities.

And, with that, my time is expired, and I would like to recognize Mr. Allred for 5 minutes.

Mr. ALLRED. Thank you, Mr. Chairman.

I also have a small aviation industry in my area. I represent Dallas, where, of course, Southwest and American Airlines are headquartered, and we have major aviation employers, and it is critically important for us.

And as we talk about dealing with the pipeline issues and getting more folks into the pipeline, as has been discussed today and I think as you just discussed, Captain, it seems to me the best way for us to do that is to throw open the doors and also to increase the diversity of our pipelines, particularly for our pilots.

To me, this is something that I have made a focus of in my time in Congress to try and introduce some of our talented youngsters to this pathway. It also, of course, will help us bring more people into the profession, but also open new avenues.

And, Dr. DeVivo, we have heard a lot about how your students and other prospective pilots are having trouble paying for school and run out of funds and can't qualify for loans. I am working on legislation right now to increase the caps on student loans for folks attending flight school.

I wonder if you could discuss how that would help to increase the diversity of the students and the folks seeking to get into this profession.

Ms. DEVIVO. Yes, absolutely. Thank you for the question.

So many of our families can't qualify for a parent PLUS loan, because they either don't have the credit history or they don't have the credit score to qualify, which means they have to go to the alternative loan market, where the interest rate is quite high.

I have a female pilot, a Black female pilot, graduated with $90,000 in alternative loan debt at a percentage rate of 18 percent. That makes it hard to eat while you are trying to get your hours, right? So, this idea of having the loans for subsidized or unsubsidized raised means that they would have a much more reasonable interest rate, but also they would qualify for income-based repayment, so, it would be affordable as they make their way to an awesome career.

Mr. ALLRED. Absolutely. That is very important to note.

And, Captain Ambrosi, I know workforce diversity is an area where the Air Line Pilots Association has been very engaged, and I want to thank you for that. And just wanted to know if you could add anything to what you just said in response to the last question around throwing open the doors, particularly access to these loans, and how you would see that benefiting in terms of creating a more diverse pipeline for pilots.

Mr. AMBROSI. Absolutely. Look, at the Air Line Pilots Association, we pride ourselves on outreach. And it is not just about the people that are members now but the future generation, embracing the next generation.

We do over 1,000 visits a year to everybody from middle schools to universities. We put ACE Clubs at universities to try to increase the outreach to folks from a more diverse background. And, again, it is an all-of-the-above type of approach. We get out there, get the message out there. That is part of it, is getting that message out there that, yes, you can become an airline pilot. You can become a mechanic. You can become anything that you want to become. So, we pride ourselves on getting out there and delivering that message.

And it does help that now the entry-level pays of this job are getting better to where you can fund some of these student loans. Back when I came through, the pay was so miserable that a student loan was a burden that was very difficult. So, fortunately, we have negotiated better pay and working conditions at most airlines. And the student loan process is essential. So, whatever we can do to help at ALPA.

Mr. ALLRED. So, specifically, you would support increasing the caps on student loans?

Mr. AMBROSI. Absolutely.

Mr. ALLRED. Yes. That is great. Thank you, sir.

My last minute here, President Malarkey Black, as you know, Congress took action in 2018 in the FAA reauthorization to create section 625. I know we have had a lot of discussion about that today, to allow Government and industry stakeholders to work together to encourage more Americans to pursue good-paying careers in aviation.

Beyond reauthorizing and increasing the amount of money in the program, are there other improvements you think we should make to it?

Ms. BLACK. Yes. Thank you for the question. I think we are doing a great job on outreach. And I think the workforce development, the grants have been very, very powerful in curriculum development, in teacher development, and that's strengthening us. But we could go even further and allow that to help people, use it as another tool to pay for education and training, both for pilots and mechanics.

And I also want to add a comment. We have talked a whole lot about the degree pathway, which remains really important, but it is also important to support students that are coming through certificate programs, part 141, highly structured training programs.

There aren't enough of those today. Right now, two-thirds of the pilots qualify through hours-based qualification. That is another way where we can inject more areas of support but also higher structure for the pilots that are coming in.

Mr. ALLRED. That is great. Thank you so much. Mr. Chairman, I will yield back.

Mr. BURCHETT [presiding]. Thank you, sir. I now recognize myself, which I think is kind of weird to say. I have always thought that, but I guess I am doing it.

And I appreciate my friends' talk about diversity. My mama actually flew an airplane during the Second World War. And I am an unrepentant mama's boy. And I like the fact that there are three women up here at this time. And I had always thought that if it was now, mama would be flying me up here to DC, but at the time that was just—after the war, it just probably wasn't the coolest thing, although I carry around a picture of her in her airplane, and it is very cool to me. And after she passed, she was actually put into Knoxville College's Hall of Fame. That is a Historically Black College there in Knoxville where she taught. So, very proud of my mama.

Anyway, Captain Ambrosi, you stated that pilot training backlogs contributed to air travel disruptions last year. Can you explain this, and do you expect similar problems in the future?

Mr. AMBROSI. Thank you for the question, sir. And I have a daughter who is 8, and I hope she gets into this profession as well. It is a great one.

Mr. BURCHETT. I have a daughter who is 15, who rides horses. I wish she had taken up motorcycles. It is cheaper and a lot safer.

Go right ahead.

Mr. AMBROSI. If my daughter is watching, I am going to ask her to take up motorcycles and not horses, because I understand what you are going through.

Mr. BURCHETT. Yes, sir.

Mr. AMBROSI. Look, let's make no mistake. Last summer, the airlines overscheduled. They had airplanes available. Because of the pandemic and the training backlog and the fact that they had displaced so many pilots, they had to be retrained. They had available airplanes. The passenger demand was there. They said, hey, let's go to the nth degree to try to get these people where they want to go, and they overscheduled.

We are getting caught up. The big airlines have more pilots than they have ever had by thousands, thousands more than pre-pandemic levels. So, can I——

Mr. BURCHETT [interrupting]. You don't expect that to happen in the future, or is there a caveat, as we say?

Mr. AMBROSI. If I had a crystal ball, I would buy a lottery ticket. But I would tell you that I think the ball is in their court. They have a lot more pilots, and they should be fine this summer, but the ball is in their court. If they decide to go, let's push it just that extra X percent to maximize revenue, then we could have a problem. But they are certainly in a better position this year than they were last summer.

Mr. BURCHETT. I hate it when they push it when I am trying to get back to Knoxville.

Ms. Black, GAO determined that the pilot supply grew from 2017 to 2022, but the regional airlines are struggling to attract and retain pilots. What is being done to encourage the employees to stay with these regional airlines?

Ms. BLACK. Thank you for the question. I want to speak first to the comment that the supply of pilots has increased from 2017 to 2022. We hear that sometimes. That talks about certifications and, in fact, they have increased. But what is being missed in that conversation is what happened and what may be contributing to that banner year that we are having. And we don't have to look too far back to see what that is. It was the pandemic.

During that time, about 4,100 fewer pilots than we expected actually qualified. And so, they are catching up. They are still catching up. We haven't quite gotten back to where we should be. But once you adjust for that, we are below average.

So, we are, beyond that, looking at about almost half of our workforce within the next 15 years will hit that hard stop at age 65. So, everything that we do now matters.

What we are doing to try and retain our workforce is not just increasing pay and quality of life. And sometimes that means moving bases a little bit closer, hiring people in bases that may not be the most maximum efficiency, but it is what the pilots want. So, we are trying to meet that. Flow programs and other things like that.

But they can only go so far. What we need to do is make it easier and equally safe to get into this industry and lower those access barriers that are keeping so many people who could come in and keep us connected out of the industry today.

Mr. BURCHETT. Thank you.

Ms. Krause, is there any evidence that the Aviation Workforce Development Grant program will be successful?

Ms. KRAUSE. Sorry, sir, what was the question?

Mr. BURCHETT. I said, is there any evidence the Aviation Workforce Development Grant program will be successful?

Ms. KRAUSE. At this time—so, the grant period is 18 months. So, those folks that received grants should be reporting to FAA the outcomes and results of those grants. And so, we should know sometime this summer. Those will start coming in, to see what came of those funds from those grants.

Mr. BURCHETT. OK. What industry-driven initiatives could be expanded or replicated to grow the workforce?

Ms. KRAUSE. I mean, there are a number of actions that, when we have looked at what folks are doing to respond to supply have been things like raising pay, both at the regional and the mainline carriers.

It is really a shared responsibility and a partnership across industry, schools, Government. So, you see things like airlines creating flight schools to support training, as well as aviation maintenance workers, there are apprenticeship and other partnership programs between schools and industry to support the pipeline.

Mr. BURCHETT. Thank you. And I have run over 17 seconds.

At this point, I recognize my dear friend from Washington, DC, Ms. Norton.

Ma'am.

Ms. NORTON. Thank you, Mr. Chair.

Dr. DeVivo, in your testimony, you highlighted the need for outreach to diverse communities to address workforce challenges. As you may know, Black Americans account for just 6.2 percent of the aviation workforce and 2.6 percent of pilots and flight engineers.

While the recruitment efforts for diverse candidates have increased in the past decade, you noted that diverse students may not be able to afford to pursue the secondary education necessary for these highly specialized jobs.

Should additional types of financial aid be made available to help low-income students enter the aviation field?

Ms. DEVIVO. Yes, absolutely. One of the great ways to do that is by doubling Pell.

Ms. NORTON. Ms. Krause, I have been told by pilots that one of the major barriers to pilot certification is a shortage of designated pilot examiners. Flight students who have completed the requisite education requirements still have to wait to display their knowledge in exams because there are not enough examiners to account for all the students.

Does GAO have any statistics on recommendations related to designated pilot examiners and their impact on the current workforce challenges?

Ms. KRAUSE. We have certainly heard that as an issue, but we haven't looked at it specifically. We would be happy to work with your office to get some additional information.

Ms. NORTON. I would very much appreciate that.

Mr. Thress, training costs are a major barrier in pilot recruitment. Could utilizing flight simulators in more educational institutions decrease costs for students?

Mr. THRESS. Yes. The cost to operate a simulator is usually significantly lower than operating an actual airplane. And simulators can also serve as a, what we call a rehearsal mechanism, so, that time in the actual airplane is more valuable.

Ms. NORTON. Well, we certainly need to get on that.

Thank you, Mr. Chairman. I yield back.

Mr. JOHNSON OF SOUTH DAKOTA [presiding]. The Chair would recognize Mr. Collins for 5 minutes.

Mr. COLLINS. Thank you, Mr. Chairman.

The cost of training for commercial pilots is substantial, and that is why I introduced H.R. 1818, the Aviation Workforce Development Act. This commonsense bill will make education costs of FAA-certified pilot and aircraft maintenance technical schools a qualified expense for 529 plans.

And I want to thank Chairman Graves and Ranking Member Cohen for their co-leading and help in this effort with me and the bipartisan group of 30 Members and numerous stakeholders who have endorsed this legislation.

Y'all, it is a simple bill. All we want to do is give aspiring aviators and aircraft mechanics the same tools to train for these vital careers as those seeking 4-year degrees.

Captain, I am grateful for ALPA's support for this bill. And can you just specifically, can you tell the committee how this policy will contribute to a steady supply of commercial pilots?

Mr. AMBROSI. Absolutely, sir. Thank you for your leadership.

Anything that can lower the barrier for entry is a good thing. All-of-the-above approach. So, adding this to the suite of products or things that we are doing to try to lower those barriers for entry is a good thing.

Mr. COLLINS. Thank you. There are actually over 13 million people with 529 savings plans.

Ms. Black, I am also grateful to have the support of the Regional Airline Association. The Aviation Workforce Development Act unites the aviation community, including industry, labor, education, and flight training associations.

Can you tell us how H.R. 1818 will make pilot and mechanic training more accessible and, therefore, help the airlines meet the growing demand for air service?

Ms. BLACK. I also thank you for your leadership on that and the other programs.

It is so crucial that we are reaching out to more pilots, and I think that is one area where the industry and congressional stakeholders are successful.

Where we are less successful is actually allowing people over the burden, and that often comes down to money. So, programs like you have offered that give grants and actually put money in hands of people who are either training or are getting trained are really critical.

It is also important that we give people access to the best training and making sure that the things that we are doing are not just focusing on the degree pathway. In fact, most pilots that qualify newly already have college degrees.

So, everything we are doing needs to look not just at the very valuable degree pathway, but also at the other certificated and accredited institutions that are providing training.

Mr. COLLINS. Thank you. Thank you. That is all I have, Mr. Chairman. I yield back.

Mr. JOHNSON OF SOUTH DAKOTA. Thank you very much, Mr. Collins.

Next up is Mr. Payne. He is recognized for 5 minutes.

Mr. PAYNE. Chairman, I thought Mr. Carbajal is next.

Mr. CARBAJAL It is OK. Go ahead. It is OK.

Mr. PAYNE. Thank you, Mr. Chairman. Since 2000, the passenger airline industry has consolidated significantly with eight mainline passenger carrier mergers, and the ninth is still pending. Over the same time period, there have been three outside events that had disproportionate impact on the airline industry: September 11, the Great Recession, and COVID.

Against that backdrop of these disruptions, people looking at career pathways could be forgiven for choosing an industry that seemingly provides greater stability and isn't on the front line of layoffs and economic downturns.

Ms. Faye Marlarkey Black—Ms. Black, how do you help prospective employees feel competent in choosing a job in the aviation sector?

Ms. BLACK. I think that comes down to the help of the industry, and it is all interconnected. The health of pilot careers—and not just pilot careers, but the other individuals who lose their jobs, and we don't have enough pilots—depends on a healthy industry, and so do the communities that regional airlines exclusively connect. And so, I think we focus on a safe and a healthy and a strong environment for our airlines. We were extremely grateful for the leadership of this committee and Congress in the Payroll Support Program. It saved our workforce. And you also leaned in hard to make sure that regional airlines, which look a little bit different from the majors, were able to access it, and for that I thank you.

Mr. PAYNE. Thank you. The importance of a diverse workforce is not just a matter of equity, but also improves the overall operations of the aviation industry.

Captain Ambrosi, can you please share with us how recruiting a diverse workforce improves the safety of airline operations?

Mr. AMBROSI. Yes, sir. Thank you for the question. Having a diverse workforce is essential. We have over 1,000 visits a year from middle schools on up trying to encourage the next generation of pilots to getting into this. This is a wonderful job. As I have said many times, this is a great profession.

And Federal loans, grants to build aviation programs at Historically Black Colleges and Universities and other minority-serving institutions, 529, it is an all-of-the-above type approach. So, doing that will certainly help bolster our workforce moving forward.

Mr. PAYNE. Thank you. It is just a matter of necessity these days that we look to diversify this workforce. We are running out of the normal people that have been able to get these jobs over decades and the people that are in this position to potentially move into that position look a little different than the workforce of the past. So, it is just necessity in numbers that we diversify. And with that, I will yield back.

Mr. JOHNSON OF SOUTH DAKOTA. Thank you, sir. I will recognize myself for 5 minutes. Mr. Ambrosi, I want to make sure I have a proper understanding of the kind of medical examinations that pilots go through. It is my understanding there is a routine medical examination every 6 months. There is an EKG every 12 months for

pilots over 40. And then, of course, you have got the regular recurring training and qualifications regimen. Is that right?

Mr. AMBROSI. That is correct.

Mr. JOHNSON OF SOUTH DAKOTA. So, commercial airline pilots are forced to retire today at 65. You can be older than that and be a part 135 operator, right? That would be charter jets, corporate jets. Is my understanding on that right?

Mr. AMBROSI. It is the exact number of passengers you can carry. I am not sure, but yes, in a general nature.

Mr. JOHNSON OF SOUTH DAKOTA. So, do we have data-based evidence that tells us that part 135 operators between the ages of 65 and 67 are more dangerous than part 135 operators between the ages of, say, 60 and 65? Is there a data-based evidentiary record for that?

Mr. AMBROSI. I am not here to say who's dangerous. I can tell you that the Europeans have studied this extensively, raising the retirement age past 60 with medical evidence, and it said, no, it is not a good idea, and they are recommending against it.

Mr. JOHNSON OF SOUTH DAKOTA. So, you said Europeans have studied this extensively and that you have knowledge of that research. So, Captain, do we know what data they used to draw the conclusion you said they had drawn?

Mr. AMBROSI. Sir, I am certainly happy to have my team share with your team the studies that they referenced.

Mr. JOHNSON OF SOUTH DAKOTA. Sure. I mean, we have thousands of these part 135 operators between the ages of 65 and 67. If there was evidence that there was an adverse impact on safety, wouldn't we know that in this country? Would we need to look across the pond to be able to understand the safety environment?

Mr. AMBROSI. Look, right now, airlines with hundreds of people in the back get much more scrutiny than what might be happening in general aviation and other sectors. So, I can't speak to accident rates in general aviation or whatever. What I can tell you is in part 121 airline operations, which I do, we have had a 99.8-percent reduction in accidents in the last 10 years. And it is based on the current system. The current system is working. I will mention on top of the fact of the retirement age, those are the other hurdles, which I have previously addressed where pilots over the age of 65—the international standard is 65—those pilots would no longer be allowed to fly internationally and would cause a——

Mr. JOHNSON OF SOUTH DAKOTA [interrupting]. Oh, Captain Ambrosi, you and I both know there are all kinds of instances in transportation and elsewhere where America is able to lead the world. I don't think we want to give the Europeans a veto over what we view as a safe and efficient aviation system.

So, Ms. Black, I will turn to you. In your testimony, I think you noted that in the next 15 years, 50 percent of pilots will be retiring. One number that I think I also heard was 17,000 retirements in the next 9 years. What is the likelihood that those retirements would have an adverse impact on rural markets like those in my State?

Ms. BLACK. They will hurt rural markets first and worst just as the retirements and the other attrition has for rural markets first and worst under the existing pilot shortage. And I would be remiss

if I didn't mention a couple of things about the safety record of older pilots. These pilots are not operating in a different world, they are operating in our country. They are flying over your schools, your churches, your synagogues, they are in our system, and they are flying safely.

Canada and Japan have a retirement age that is higher than 65. And ICAO is actually looking at increasing the retirement age in Europe as well.

Mr. JOHNSON OF SOUTH DAKOTA. So, Ms. Black, if the retirement age for commercial airline pilots was moved from 65 to 67, might that help improve rural air service?

Ms. BLACK. Yes, very specifically, it would alleviate the captain shortage that we have. These are some of the most experienced pilots, and they are needed to develop the next generation.

Mr. JOHNSON OF SOUTH DAKOTA. Ms. Black, does the bulk of literature in this area suggest that pilots between the ages of 65 and 67 would have an adverse impact on safety?

Ms. BLACK. Absolutely not.

Mr. JOHNSON OF SOUTH DAKOTA. OK. Mr. Ambrosi, turning again to you, I thought the chairman in his opening comments did a great job of talking about ATP. And earlier you mentioned that the FAA already has the flexibility in law to develop some additional pathways to an ATP. That sounds great to me. Would you join me in encouraging the FAA to use the flexibilities they already have in law?

Mr. AMBROSI. Sir, to your previous question, and I will jump right on——

Mr. JOHNSON OF SOUTH DAKOTA [interrupting]. I only have 14 seconds, sir. I have got to get an answer. Would you encourage the FAA to use those authorities they have?

Mr. AMBROSI. No one has given them a proposal. So, bring a proposal, and let the FAA take a look at it.

Mr. JOHNSON OF SOUTH DAKOTA. All right. Good. Thank you, sir. With that, my time has expired. And we will look toward Mr. Carbajal. You are recognized for 5 minutes.

Mr. CARBAJAL. Thank you, Mr. Chair. Captain Ambrosi, there is a lot of noise regarding the current supply of pilots in the workforce. GAO testimony mentions the supply of pilots is expected to increase. From your perspective, do we have enough pilots in the workforce to meet the current and future demands, especially as we welcome new entrants into the airspace?

Mr. AMBROSI. Yes, sir. The pilot supply is good. The pipeline is full. We have a training backlog. As in any pandemic-related industry, we are getting caught back up. Help is around the corner. Pilots are training as fast as they can. So, we do need to get—as we said previously, keep outreach, get more people involved in this, more diverse backgrounds, but the pilot supply is good.

With your indulgence, I would like to reference a fact on FAR 135 accidents. There have been 79 accidents since 2010 with hundreds of fatalities, just to put that on the record.

Mr. CARBAJAL. Thank you. I recently ran into one of my colleagues across the aisle, former General Bergman, who is a pilot himself. And I was really taken aback. He volunteered that he was adamantly against changing the age for our pilots. And it just

caught me off guard because I wasn't even discussing that issue with him. But I only mentioned that because he is somebody who I respect greatly and served in the Marine Corps as I did. And, again, he went to great lengths to let me know why he was concerned with that proposal.

Mr. Thress and Captain Ambrosi, can you identify and describe any conditions, factors, or scenarios that flight simulators do not capture that real-world flying does?

Mr. THRESS. There are certainly some scenarios and some physiological effects that the simulator doesn't capture. So, one would be the effects of Gs. So, during an unusual recovery in the simulator, you will still only feel 1 G on your body, whereas in the airplane you may feel 4 or 5, which can be disconcerting if you are not accustomed to it. So, that would be the first thing that comes to mind.

The second thing is we simulate rapid decompression and emergency descents. But we do that through aural cues, and the cues provided by the aircraft's annunciator system rather than your ears popping and the other effects of actual change in pressure. Those things are done in another simulator called an altitude chamber.

Mr. CARBAJAL. Thank you. Captain?

Mr. AMBROSI. Thank you, sir. In addition to the items Mr. Thress discussed, a simulator can't be programmed for everything. So, there are real-world situations. But let's point out the most obvious thing that a simulator can't do: Give you that "I could perish if I don't do the right thing" thing. Because a simulator, you can always get out and reset and walk away, which you can't do in a real airplane in real airspace.

Mr. CARBAJAL. Thank you. Ms. Krause, your testimony cites that although women represented 47 percent of the total U.S. workforce in 2021, only 17 percent of the pilot students are women. Obviously, I think we can do a better job of encouraging women to join STEM careers.

How can we do a better job of ensuring our aviation workforce is reflective of our Nation's diversity, including women?

Ms. KRAUSE. The issue of diversity is really a shared responsibility with the Government, industry, and the schools. I think as Dr. DeVivo referenced, you have a couple of task force reports out there with a number of recommendations to the Congress, to FAA, to industry. It is important to take a look at those, the different parties and see what might be implemented. On the FAA side, they have shared with us what they plan to start looking through those recommendations, figure out how they might implement them, and then track them on their website.

Mr. CARBAJAL. Thank you, Mr. Chairman, I yield back.

Mr. JOHNSON OF SOUTH DAKOTA. I thank Captain Ambrosi for sharing his information regarding part 135 operators, and I know we want a full and complete record. So, I would just ask afterwards you follow up breaking down those incidents by pilots between the ages of 65 and 67 and that rate versus pilots who are younger.

With that, let's go to Mr. D'Esposito of New York. Sir, you are recognized for 5 minutes.

Mr. D'ESPOSITO. Well, thank you, Mr. Chair, and good afternoon, everyone. Thank you for being here. As you may or may not know,

Long Island is a proud host of the N90 TRACON. It is actually nestles in the north center part of my district. I visited there a couple of weeks ago. I met with the individuals who run that facility, and it was definitely eye-opening to the aviation industry.

But as we have discussed today, unfortunately, the Nation's workforce challenges deeply have affected the aviation community. And on the topic of the current and future challenges facing the aerospace workforce, air traffic controllers play a vital role in ensuring flight safety and efficiency.

There is an air traffic controller shortage that has been overlooked, we believe, for far too long. And the number of air traffic controllers that have clocked enough training hours at N90 are dangerously low, and if left unaddressed, will be harmful to New Yorkers and obviously their passenger experience.

So, my questions are for Dr. DeVivo. Are there any regulatory barriers that have prevented timely training and certification for our much beloved air traffic controllers?

Ms. DEVIVO. Yes. So, thank you so much for that question. And we are a certified—a collegiate training institute as part of the FAA's program to work with institutions to offer air traffic control. And we are in New York, and they like to work with us because our students want to come home.

Mr. D'ESPOSITO. Right.

Ms. DEVIVO. And they will do a set of four courses and then get a recommendation from us if they graduate and pass those courses effectively and go on to training at Oklahoma City. I know that N90, because I am in New York, too, has been a bit of an issue. It is something that we are more than happy to assist with, because of the fact that our students want to come back to New York. The JFK tower is almost completely filled with Vaughn graduates. And many of our students are at the TRACON as well. It is a very complicated training spot, and it is hard to hold onto folks as well. So, I don't know enough about exactly what their training program is from Oklahoma City to the N90, but I do think that there are options to help with that.

Mr. D'ESPOSITO. And it is good to hear you say that they want to come home, because I know that we are working hard to make sure that we keep the 30 or so air traffic controllers that have been asked by the FAA to move elsewhere to stay at that facility. So, I think that is what we all want: for them to come home. And, obviously, has the current workforce challenges, how has it affected your institution?

Ms. DEVIVO. Right, so, we have lost about 26 percent of our enrollment since the start of COVID. We were on this nice uptick as the demand increased, and COVID hit our families really hard. As you know, New York City was particularly hard hit by COVID. Our ZIP Code was one of the hardest initially hit. And so, our families, whose average family income is anywhere between $34,000 and $42,000, they lost their jobs. They lost family members who died because of the coronavirus. And so, education was not something that they were able to do. So, we have had quite a few stop-outs. But we are starting to see the enrollment come back. The salaries certainly help in terms of encouraging students to consider aviation and aerospace as a career path.

Mr. D'ESPOSITO. Yes, and so, I guess to that point, have there been any changes that you made at Vaughn to attract new students and to have that uptick once again?

Ms. DEVIVO. Yes, so, we really, really work hard to sell the return on investment, right? So, we are talking a lot about a defined career pathway. That is why our students come to us. Because their students and their families want to know: What is the job at the end of this? When can I start to see some income for my family? And we are not just changing that student's story, we are changing that whole family's trajectory. And so, having the ability to talk about the demand, which thankfully the media covers for us, has been hugely helpful in terms of attracting students to the programs.

Mr. D'ESPOSITO. Well, I appreciate your work and, obviously, if there is anything that I can do to help keep our people home and make sure that they stay working and living in New York, which is obviously very often burdened with some high taxes, we want to keep them there. So, I appreciate your work. Mr. Chair, I yield back.

Mr. JOHNSON OF SOUTH DAKOTA. I thank the gentleman and would now turn to the gentleman from California, Mr. DeSaulnier.

Mr. DESAULNIER. Thank you, Mr. Chairman. Captain Ambrosi, I want to give you a second to finish your thought to the chairman. I agree with him about American exceptionalism and can-do spirit, but I also believe Americans can learn from others. You were finishing about some of the things that Europeans were doing in terms of retirement age.

Mr. AMBROSI. Thank you, sir. I appreciate that. I just wanted to point out that part 121 operations are the safest they have ever been. And my team gave me some facts on other parts that had been referenced and just wanted to share that with the committee, but I am happy to follow up with more detailed data for the committee.

Mr. DESAULNIER. And we can always explain to the Europeans how well we do as well.

Mr. AMBROSI. To follow up on the ICAO piece, because I did get cut off on that, was ICAO is not just going to change the rules because the U.S. says. That is just not how it works. They will put it into a study. So, if the Europeans say one thing, and the U.S. says another, we know how this world works, it is not going to be, oops, the U.S. said this, so, let's flip the switch. They are going to put it into a study, which could be, who knows, years. So, just to clarify on that point.

Mr. DESAULNIER. I appreciate that. And I really appreciate the chair and the leadership to have all of these thoughtful hearings. Reauthorization is a wonderful opportunity to look at all that we have done successfully, but also changing times, and, certainly, this one, with workforce development. At our last hearing, I was able, during my 5 minutes, to talk about air traffic controllers, in my experience, in the San Francisco Bay area, retaining those folks and training them. In my experience, with the near miss with Air Canada 9 years ago, where it was because of humans properly trained to the continuous training that avoided that. So, whether it was Captain Sullenberger and the Miracle on the Hudson, or that in-

stance, or so many that we don't know, it is proper training and attracting people, but retaining them and training them.

So, I am going to read you a quote from a mutual friend, Captain Ambrosi, and I want you to respond to it. Quote: "Airline industry lobbyists and some in Congress are still trying to cut pilot training in half to cheapen and quicken it. That is a dumb and dangerous idea. With the recent shocking airline near misses and close calls, now is absolutely not the time to cut corners. No one would want their loved ones to board an airliner piloted by a crew not able to handle whatever challenges they will face." Unquote.

So, maybe you can respond to that. That is from a press release from a friend, a mutual friend, Ambassador Sully Sullenberger. And to quote, the headline on this is "Ambassador Sully Sullenberger Denounces Attempts To Cheapen Pilot Training."

So, the context of what I just said about the importance of having, not just getting people to go in the field, but to continue to keep those high standards. So, at that moment of decision, we have someone who is properly trained and continues to be trained at a minimum of the current standard so that we avoid these tragedies.

Mr. AMBROSI. Yes, sir. Well, I better be careful because no one knows better than Sully, right? So, commenting on his comments could get me in trouble. But I agree with him 100 percent. Right now, we are at the safest point in history, but yet we are still seeing some of these incidents. This is the wrong time to consider changing rules, potentionally rolling back safety regulations. Now is the time to make sure—pilots embrace technology. But as you said so well, sir, we are there, we are that last line of defense. So, we embrace technology. But a well-trained, well-rested, qualified flightcrew on the flight deck are that last line of defense when it comes to safe operation of the airplane, passengers, crew. So, thank you.

Mr. DESAULNIER. And I understand the pressures on the industry. I have said this before, investment money is very mobile globally. People expect the return on investment, but it doesn't serve that return on investment in the long term to risk safety. And these questions about these near misses—I don't want to be pollyannish about this—the FAA and we collectively have a great record. So, I don't want to raise alarm, but they are clearly messages, are they not, that these are things that we should do root canal—root canal, Freudian slip—root causes that really get to the human factors in particular. There is a lot of pressure to push people through. And people want to travel. That is a good thing.

Mr. AMBROSI. Yes, there is pressure on the system, right? We have a lot of new. It is not just pilots. We focused a lot on pilots here today. Rightfully so, because we are the most forward facing of the industry. But it is mechanics, flight attendants, gate personnel, people that work on the ramp, it is reservation agents, this whole system, air traffic control. Everything has a lot of new because of the post-COVID environment. People left the industry, not just pilots. Now a lot of new people are getting into the industry. So, we need to redouble our efforts on safety. Redouble our efforts to look at why those things are happening and work together—industry, FAA, labor—look together and say, hey, what are we doing? Do we need some more additional training? I apologize on the time.

Mr. DESAULNIER. Thank you. I yield back. And if you hear from Captain Sullenberger, you can blame me.

Mr. JOHNSON OF SOUTH DAKOTA. And the soft tap was just a gentle notice. When you have got people as experienced as Captain Ambrosi and the gentleman from California, you get an extra 15 or 30 seconds if you need it. So, if you want to finish your thought, Captain, of course, that is fine.

Mr. AMBROSI. No, that is fine. I was wrapping up anyway. Again, safety is why we are all here.

Mr. JOHNSON OF SOUTH DAKOTA. Very good. The gentleman yields back. Are there any further questions from anyone on the subcommittee who may not have yet been recognized? Seeing none, that concludes our hearing.

I want to thank each of our witnesses for your testimony. You did a good job. This is not the easiest thing in the world to do. Great job.

I would ask unanimous consent that the record of today's hearing remain open until our witnesses have had an opportunity to respond to any questions they may have been asked that were submitted to them in writing. Without objection, that has been ordered. And then secondarily, I would ask unanimous consent that the record remain open for 15 days to allow Members to make additional comments or raise additional questions. We could also have the witnesses make additional comments, if they so wish. Is there any objection?

Seeing none, that is so ordered. And with that, ladies and gentlemen, this subcommittee stands adjourned.

[Whereupon, at 12:30 p.m., the subcommittee was adjourned.]

SUBMISSIONS FOR THE RECORD

Statement of the Aircraft Owners and Pilots Association, Submitted for the Record by Hon. Garret Graves

INTRODUCTION:

Chairman Graves, Ranking Member Cohen, and Members of the Subcommittee, thank you for the opportunity to provide the Aircraft Owners and Pilots Association's (AOPA) perspective on "Examining the Current and Future Challenges Facing the Aerospace Workforce."

As the world's largest aviation membership organization, AOPA represents the general aviation interests of over 300,000 aircraft owners and pilots in the US. Our members collectively operate over 85% of all general aviation (GA) aircraft in the country and represent two-thirds of all pilots.

With a mission of protecting and defending the freedom to fly—while prioritizing safety—AOPA has been a pillar of the aviation industry since its founding in 1939. However, attracting the next generation of diverse aviators is crucial for the industry's success.

Despite positive initiatives to address workforce challenges and promote diversity within aviation, there remains a lack of coordination between different sectors of the industry and government.

One of the biggest challenges facing our industry is ensuring that the United States has a well-qualified, well-trained, and diverse workforce to meet the demands that are present today and will remain well into the future.

AOPA INITIATIVE TO ADDRESS THE NEXT GENERATION OF PILOTS:

Boeing's 2020–2039 Pilot and Technician Outlook projected a global need for over 760,000 new pilots and 730,000 aviation technicians over the next 20 years. Of those, North America will require over 200,000 new pilots and a significant number of new technicians. A Boeing executive summary emphasizes that "meeting the projected long-term demand" for aviation positions "will require a collective effort across the global aviation industry" as "tens of thousands of pilots, technicians, and cabin crew members reach retirement age over the next decade." The company added that educational outreach and career pathway programs "will be essential to inspiring and recruiting the next generation."

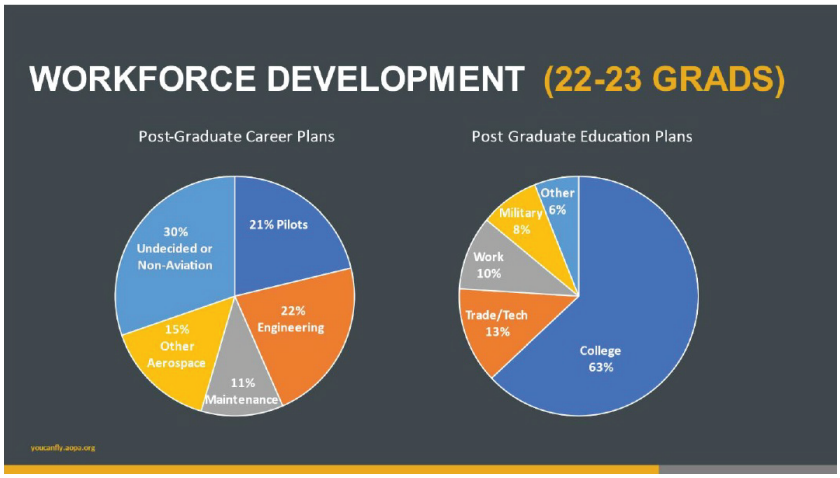
Most people that aspire to become aviators start in general aviation, and AOPA plays a significant role in shaping the future of the aviation workforce by inspiring young people to explore aviation. Nowhere is this more evident than in such initiatives as the AOPA Foundation High School Aviation STEM Curriculum. By offering high-quality aviation education to high school students across the country, AOPA is creating a pathway to rewarding aviation careers for thousands of young adults from diverse backgrounds.

The courses offered by AOPA are designed to capture the imagination of the students and provide them with the necessary tools to pursue advanced education and careers in aviation. Not only does AOPA offer a free curriculum, we also take the lead on educating the educators, ensuring that teachers have the knowledge and resources to best plan for success.

AOPA's High School Initiative program conforms to Common Core math and science standards, Next Generation Science Standards, FAA Airmen Certification Standards, and career and technical education best practices. By providing such a comprehensive curriculum, AOPA is enabling students to gain certification or industry-accepted tests such, as the FAA Private Pilot Knowledge test or a Part 107 small UAS (drone) pilot certification.

The AOPA High School Aviation STEM Curriculum is now offered in more than 400 schools in 43 states across the country, engaging more than 16,300 students.

Since the program's inception five years ago, we have reached more than 50,000 students, and a full 70% of those who have graduated report they are actively pursuing an aviation career.



Moreover, and as important, nearly half of our curriculum students come from minority backgrounds, and more than 20% are female. This participation represents a significant increase in diversity when compared to the current aviation workforce. Again, for aviation to keep pace with ever-growing demands, it must reflect the broader society.

Furthermore, AOPA's aviation education curriculum has also been implemented in schools of all sizes, in both rural and urban areas. The program is designed to be inclusive and accessible to students from all backgrounds, regardless of their socioeconomic status or geographic location.

The interest in AOPA's curriculum from high schools across the country has been overwhelming, and the organization is committed to ensuring that high schools have the resources they need to teach students about aviation and all that it offers. AOPA is proud to play a leadership role in developing the future aviation workforce and looks forward to continuing its work with the Committee to promote aviation education and career opportunities for all.

CONGRESSIONAL ACTION ON AVIATION WORKFORCE:

The inclusion of two aviation workforce development grant programs (aircraft pilots and aviation maintenance technical workers) in section 625 of the 2018 FAA Reauthorization law is commendable and we appreciate the Committee leadership. This provision aims to encourage high school students to pursue science, technology, engineering, and math (STEM) aviation education and training, as well as training in aviation and aerospace skills. However, as Congress takes up the next FAA Reauthorization bill, more needs to be done.

NATIONAL CENTER FOR THE ADVANCEMENT OF AVIATION ACT:

The aviation industry is still facing a significant workforce challenge that needs to be urgently addressed. While there are undoubtedly many excellent programs designed to tackle this issue, including the AOPA High School Initiative and such governmental organizations as the two aviation workforce development programs, what is lacking is the necessary coordination and communication between the various sectors of the industry. A more cohesive approach to workforce issues is crucial to ensure that our aviation and aerospace workforce in the United States remains competitive. Collaboration—and the means to foster it—is of paramount importance. We believe, and the entire aviation industry supports, the bipartisan and bicameral National Center for the Advancement of Aviation (NCAA) Act is the solution. We appreciate the leadership of this Committee to move the bill which overwhelmingly passed the House last September by a vote of 369–56.

Cong. André Carson (D–IN) and Cong. Pete Stauber (R–MN) plan to reintroduce the NCAA bill in the 118th Congress and we encourage the Committee to include this important legislation as part of the next FAA Reauthorization Act.

This bill calls for the establishment of a federally chartered 501(c)3 not-for-profit national aviation center that would facilitate cooperation, collaboration, and coordination across all sectors of aviation: civil, commercial, and military. The NCAA would focus on key areas including aviation and aerospace STEM curriculum for middle school and high school students, establish scholarships, apprenticeships, internship or mentorship programs to pursue careers in aviation or aerospace-related fields, support military veterans who would like to transition to a career in civil aviation or aerospace and provide a critical forum for cross-disciplinary collaboration and cooperation between governmental, non-governmental and private aviation and aerospace stakeholders to address the aviation and aerospace workforce.

The NCAA would be a private entity and no general fund taxpayer dollars would be used to support it. Funding for the initiative would come by Congress authorizing and appropriating a small percentage (3%) of the interest accrued annually on the taxes and fees collected from those who use the system and are deposited into the aviation trust fund. Using just 3% of the interest, along with the industry support, is a small investment, less than 1/10th of 1% of the Trust Fund receipts, to ensure efficiencies and effectiveness are realized for an aviation and aerospace industry that supports more than 11 million jobs and contributes more than $1.6 trillion per year to the national economy.

By uniting our collective efforts to ensure that we have a more diverse industry, the NCAA can create a pipeline of qualified and well-trained talent. It will also be instrumental in including individuals who may not have been on our radar in the past, such as women and minorities, and veterans.

Again, NCAA bill has the support of virtually the entire aviation industry, including general aviation, airlines, airport, manufacturers, unions, schools, and other entities involved in all segments of aviation and aerospace. Nearly 200 organizations, representing hundreds of thousands of Americans, have already expressed their support for this bill.

NCAA WILL ALLOW FAA TO FOCUS ON ITS CORE MISSIONS:

The FAA is facing significant obstacles in terms of modernizing the country's air traffic control system, as well as coping with such air travel disruptions as delays and cancellations that are impacting millions of Americans. The recent outage of the FAA's NOTAM system, which impacted the entire aviation system, is just one example. FAA's primary focus has been and should continue to be, to ensure the safety and efficiency of our national aviation system. Everything the FAA does should be directly tied to, and in support of, that mission, and comprise functions that can only be performed by a regulatory body.

According to the FAA's FY24 budget proposal, the agency "holds safety as the FAA's highest priority, with an emphasis on the modernization of our nation's airspace and telecommunications systems necessary to provide reliable transportation to the flying public." We fully agree with that, however, ensuring a highly talented aviation workforce for the future which is essential for the growth of the aviation and aerospace industry, should not be a primary focus of the FAA.

The NCAA, with the support of the government and the aviation and aerospace industry, is the ideal entity to help address the workforce issues we are facing. A national center focused on aviation workforce will also help increase the FAA's efficiency and allow the agency to maintain a laser focus on aviation safety and ensure FAA programs and processes are centered on its core mission of aviation safety, air traffic control (ATC), airport infrastructure, and airman and aircraft certification. We should allow the FAA to focus on getting more designated pilot examiners (DPE) in the field, fixing the special issuance medical process, ensuring that our airports remain safe and vibrant, and continuing to modernize our air traffic system.

AOPA firmly believes that FAA needs to maintain operational control and regulatory authority across its various lines of business that support its mission. However, where there are opportunities to trim functions that are not essential to FAA's core, such as aviation workforce development, we should look for bold initiatives like the National Center for the Advancement of Aviation.

CONCLUSION:

Collaboration between private and governmental organizations is crucial to address the challenges related to the development and sustainability of the aviation workforce. The aviation industry is constantly evolving, and it requires a skilled and diverse workforce to adapt to these changes. A cohesive approach is needed to en-

sure that the aviation and aerospace workforce in the United States remains competitive.

The National Center for the Advancement of Aviation Act is a bold and necessary initiative that will facilitate collaboration and coordination across all sectors of the aviation industry, ensuring a more diverse and skilled workforce, and promoting growth and sustainability in this crucial sector of the American economy while allowing the FAA to focus on its core mission—aviation safety and managing our national air space system.

We are excited about the prospect of including the National Center for the Advancement of Aviation Act in the upcoming FAA Reauthorization bill and we look forward to working with all Members of the Committee to ensure that it is included in the final bill.

Letter of May 4, 2023, to Hon. Sam Graves, Chairman, and Hon. Rick Larsen, Ranking Member, Committee on Transportation and Infrastructure, and Hon. Garret Graves, Chairman, and Hon. Steve Cohen, Ranking Member, Subcommittee on Aviation, from Airports Council International-North America et al., Submitted for the Record by Hon. Garret Graves

MAY 4, 2023.

The Honorable SAM GRAVES,
Chairman,
Committee on Transportation and Infrastructure, United States House of Representatives, Washington, DC 20515.

The Honorable RICK LARSEN,
Ranking Member,
Committee on Transportation and Infrastructure, United States House of Representatives, Washington DC 20515.

The Honorable GARRET GRAVES,
Chairman,
Subcommittee on Aviation, Committee on Transportation and Infrastructure, United States House of Representatives, Washington, DC 20515.

The Honorable STEVE COHEN,
Ranking Member,
Subcommittee on Aviation, Committee on Transportation and Infrastructure, United States House of Representatives, Washington, DC 20515.

DEAR CHAIRMAN GRAVES, RANKING MEMBER LARSEN, CHAIRMAN GRAVES, AND RANKING MEMBER COHEN,

We, the undersigned organizations, write in strong opposition to the inclusion of policies that would fundamentally undermine the existing Open Skies aviation agreement framework within the 2023 Federal Aviation Administration (FAA) reauthorization bill.

For more than 30 years, Open Skies agreements have been a bipartisan policy success, advanced by both Democratic and Republican administrations. These bilateral trade agreements allow U.S. passenger and cargo airlines to fly around the world without the government interference in airline decision-making about routes, capacity, and pricing, which was very prevalent before the U.S. decided to export its domestic aviation deregulation policies to the international marketplace.

The U.S. has reached Open Skies agreements with more than 130 countries, creating significant benefits for consumers, the aviation workforce, as well as the economy at large. Recent estimates [1] demonstrate that these accords have generated at least $4 billion in annual gains to travelers, along with a 15 percent average drop in fares. Additionally, a 2018 D.C. Circuit Court opinion [2] found that these agreements "promote competition" and that "a service authorized by a bilateral agreement is in the public interest."

Placing burdensome conditions and requirements on new foreign air carrier permits would violate existing Open Skies agreements and invite retaliation from U.S. aviation partners worldwide. During an April 19, 2023, hearing [3] in the U.S. House Transportation and Infrastructure—Subcommittee on Aviation, Airline Pilots Association, International (ALPA) President Capt. Jason Ambrosi testified in support of

[1] See: https://www.brookings.edu/wp-content/uploads/2016/06/Open-Skies-Published.pdf
[2] See: www.cadc.uscourts.gov/internet/opinions.nsf/42B692B364342E5D8525828A004DB9AC/$file/17-
[3] See: https://transportation.house.gov/calendar/eventsingle.aspx?EventID=406262

including so-called "flags of convenience" legislation within the 2023 FAA Reauthorization bill. He wrongly[4] claimed the U.S. Department of Transportation (DOT) has ignored the statutory public interest requirements of 49 U.S. Code § 40101 in past foreign air carrier permit decisions. In fact, DOT is already statutorily required to make a public interest finding in awarding routes to air carriers.

Erroneously dubbed as the "Fair and Open Skies Act,"[5] this legislation and others like it would put the U.S. in violation of an international trade agreement that could lead to legal action by foreign government partners. While ALPA has tried to downplay the threat of retaliation in the past, recent responses from the EU clearly demonstrate their intention to uphold terms of the U.S.-EU Air Transport Agreement (ATA). On July 23, 2019, the then Director-General of the European Commission (EC)'s Department for Mobility and Transport, stated in a speech[6] to the International Aviation Club of Washington, D.C., "I sincerely hope that all parties honour and value our [Air Transport] Agreement and if need be, we will use all legal means to defend ATA." The EU has also previously filed for arbitration[7] against the U.S. for breaching this pact during Norwegian Air International's application process, saying that DOT's slow-walk to a decision "constitutes a breach of the EU-U.S. Air Transport Agreement."

Additionally, in the authoritative Memorandum of Consultations[8] signed in 2010 at the conclusion of the U.S.-EU negotiations, the delegations stated explicitly that "in the event that a Party would take measures contrary to the Agreement . . . the other Party may avail itself of any appropriate and proportional measures in accordance with international law, including the Agreement." The EC has also emphasized that, if such a bill were to be signed into law, the U.S. would be in clear violation of the U.S.-EU Open Skies Agreement. As such, ALPA's assertions that the EU does not have the ability or will to unilaterally act against U.S. air carriers is demonstrably false.

We are grateful for this committee's leadership, and dismissal for more than a decade, of ALPA's dubious and misleading claims surrounding shortfalls in the Open Skies framework. A so-called "flags of convenience" bill would only serve to place the U.S. in violation of the U.S.-EU Open Skies Agreement and invite retaliation on the U.S. commercial and cargo aviation industries by our international partners—with consumers and U.S. businesses shouldering the greatest consequences. Therefore, we ask for your continued leadership in upholding the Open Skies framework in the 2023 FAA reauthorization bill.

Sincerely,

AIRPORTS COUNCIL INTERNATIONAL-NORTH AMERICA.
AIRBUS.
ATLAS AIR.
CARGO AIRLINE ASSOCIATION.
FEDEX.
INTERNATIONAL AIR TRANSPORT ASSOCIATION.
JETBLUE.

Statement of the Association of Professional Flight Attendants, Submitted for the Record by Hon. Rick Larsen

COMMERCIAL AIRLINE STAFFING CONCERNS: FLIGHT ATTENDANTS

1. The 10-hour minimum rest rule has helped significantly in providing Flight Attendants additional rest. At American Airlines, Flight Attendants still receive 8 hours "behind the [hotel] door" which means that eating, showering, preparing uniforms for the next day, and other personal tasks are all accomplished during the 8 hours. This often still leaves 5–6 hours for sleeping.
2. Crew Scheduling is not restricted from contacting Flight Attendants during rest hours. Frequently, Flight Attendants are called multiple times during the hours of 0000–0500 regarding a rescheduled flight. If the Flight Attendant does

[4] See: https://docs.house.gov/meetings/PW/PW05/20230419/115681/HHRG-118-PW05-Wstate-AmbrosiJ-20230419.pdf
[5] See: http://www.congress.gov/bill/117th-congress/house-bill/3095/text
[6] See: https://transport.ec.europa.eu/system/files/2019-07/2019-07-23-international-aviation-club-dc.pdf
[7] See: www.reuters.com/article/norweg-air-shut-eu-usa/eu-files-for-arbitration-in-u-s-dispute-over-
[8] See: www.gsa.gov/cdnstatic/Switzerland__Transport__Agreement.pdf

not answer the calls, the scheduler will send hotel staff up to the room to wake up the Flight Attendant to tell them to call the company.

3. American Airlines is still frequently unable to provide crew hotel rooms when Flight Attendants land in their layover city. This past week, with the closure of the FLL airport due to flooding, numerous Flight Attendants were stuck in the airport, sleeping in the terminal or on empty airplanes with no air conditioning, toilets, or water.
4. American Airlines is struggling with Flight Attendant attrition. Our workforce is aging out and reaching retirement age. 46.5% of American Airlines Flight Attendants are between ages 55 and 86.While Flight Attendants are hired to replace those who are resigning, retiring, or being terminated, the airline is still unable to keep up with attrition. As a result, American Airlines is then unable to staff aircraft with more than FAR minimum crew.
5. Before the pandemic, American Airlines flew premium service flights with 2 or more Flight Attendants above FAR minimum crew—typically international flights or trans-continental flights with elevated levels of service for passengers. These flights are now flown with FAR minimum crew, despite the return to a full in-flight service. American Airlines cut staffing when our planes were empty during the pandemic. Our planes are now full again. Our staffing needs to return to 2019 levels.
6. When international flights to Europe, Asia, and South America are staffed with minimum crew, if a Flight Attendant is injured or becomes ill on a layover, the company must scramble to find someone to work the flight back to the US. Pre-pandemic, international flights were staffed above FAR minimum crew. This has created delays and/or cancellations, which in turn disrupts plans for our passengers. These situations should be uncommon but are now commonplace. Additionally, it causes Flight Attendants to be rescheduled, who then lose time off work with little or no additional compensation. For example:

   Flight 293—DEL to JFK—April 16, 2023—One Flight Attendant was injured while on layover in Delhi, India. Because the flight was staffed at FAR minimum, the crew was not legal to fly the 16-hour 25-minute flight. American Airlines was nearly forced to divert to Bangor, Maine where a relief crew would be positioned to work the 25-minute flight from BGR to JFK. However, the diversion was averted because an off-duty Flight Attendant on personal travel was available. This is an extreme measure that is purely dependent on the serendipity of a crewmember being present at the out-station who is willing and able to work the flight.
7. American Airlines continues to force Flight Attendants into more "productive" schedules. There are now longer duty days, with more flight segments, and shorter rest periods. The monthly line average has increased from 74–78 hours to 81–86 hours. This equates to 1–2 extra days at work each month. These hours are the hours in which the aircraft door is actually closed, as Flight Attendants are not paid until the door is shut. Pay stops upon arrival when the door is opened. This productivity results in flying more hours, longer hours in the air and on the ground, shorter rest breaks, and fewer days off. American Airlines is currently flying more domestic vs international hours than pre-pandemic. The extra boardings, deplanings, and unpaid time between flights are much more challenging and wearing than a single long-haul international flight.
8. During high-traffic periods (spring break, summer, holidays, and 3-day weekends) flight schedules increase significantly. Even with the increased number of Flight Attendants who have been hired and trained, airlines struggle to keep up with the increased flying during these periods. The flights are full, and the company adjusts the flying schedule to meet demand, leaving crews minimally staffed on every holiday and weekend period.
9. The Flight Attendant profession has changed dramatically beginning with the attacks of 9/11 and continuing through the Covid pandemic. Flight Attendants work in small quarters, 35,000 feet in the air, exposed to fumes and radiation, outnumbered 50–1 by passengers, and on their own to manage any and all emergency situations. Social media and the news have captured in graphic detail what Flight Attendants face with unruly passengers. Assaults, attacks, and beatings are happening on a regular basis. Frequently, the assailants are released with minimal repercussions, leaving Flight Attendants feeling anxious, afraid, and unprotected at work. With additional staffing, it is easier to antici-

pate any potential conflicts and resolve them before they escalate into physical altercation.

10. All the situations previously create a job that was once, but no longer is, coveted. Now airlines are struggling to find qualified candidates and retain them. Coupled with draconian attendance policies and performance requirements for Flight Attendants, there is now even higher attrition, and airlines unable and unwilling to staff aircraft with more than FAR minimum crew. When Flight Attendants fly more, they are exposed more, and get sick more. They are disciplined for calling in sick. They are also disciplined for coming to work sick.
11. For decades, the Flight Attendant position was desired because it offered a flexible work schedule, great travel benefits, and decent pay with benefits. Most airlines stopped offering pensions during the bankruptcies in the 1980's, benefits packages were significantly reduced, and flexibility disappeared. Most Flight Attendants were willing to trade higher wages for the benefits and flexibility. However, many airlines are 4–5 years past renewal of contracts, so there have been no raises or improvements to working conditions for several years.
12. The quality of the layover hotels has also been compromised. Many hotels have bedbugs or sub-standard cleaning, exposing Flight Attendants to even more germs and sickness than what they are exposed to on the aircraft. During the pandemic, airline management had to be pressured into allowing Flight Attendants to wear masks saying it would 'scare the passengers.' As frontline essential workers, APFA lost Flight Attendants to Covid during the pandemic.
13. Workers' comp claims for Flight Attendants are frequently denied. Studies on professions with the highest number of on-the-job injuries usually include Flight Attendants on the top ten, if not top five, list of unsafe jobs. Additional staffing would prevent repetitive-use injuries sustained from closing overhead bins, lifting bags, and carrying heavy items.
14. Scheduling flight crew at FAR minimum is not good for either airline customers or employees. Weather events and mechanical issues will always exist, but understaffing delays are entirely preventable. When proper staffing is in place, the airline is nimbler to recover the operation and get passengers to their intended destinations.

Letter of April 19, 2023, from the Families of Continental Flight 3407, Submitted for the Record by Hon. Rick Larsen

APRIL 19, 2023.

United States House of Representatives,
Aviation Subcommittee of the Committee on Transportation and Infrastructure, Washington, DC.

DEAR SIR OR MADAM:

The 'Families of Continental Flight 3407' appreciate the offer to provide a submission to the record regarding House Aviation Subcommittee hearing "FAA Reauthorization: Examining the Current and Future Challenges Facing the Aerospace Workplace".

First, we want to thank members of Congress who unanimously passed landmark aviation safety legislation Public Law 111–216, 'The Airline Safety and Federal Aviation Administration Extension Act of 2010'. Implemented by the FAA, this legislation significantly upgraded safety standards for pilot qualification and experience, pilot training, safety management systems, pilot flight and duty rules, pilot resource development, a new Pilot Record Database, and oversight. These improvements along with continued focus by aviation stakeholders have contributed to the safest period in U.S. aviation history where there has not been a domestic Part 121 fatal airline crash in over 14 years.

We feel it important to respond to comments offered by House Transportation and Infrastructure Chairman Graves in his statement, questioning the value of pilot flying hours of experience by referring to actual pilot flying hours of experience in several regional airline crashes that occurred before the Airline Safety Act of 2010 was passed. His passionate comments selectively focused on pilot flight hours at the time of each accident and are not reflective of the true intent of the Airline Safety Act of 2010, where all upgraded requirements work together to result in a safer aviation system. The Families of Continental Flight 3407 refer to the phrase, "Let's put the

best pilots in the cockpit and set them up for success". Flight experience *PRIOR* to becoming a Part 121 Captain or First Officer is important, and a critical component of the screening and preparation for the responsibility of transporting passengers safely to their destinations.

When Captain Renslow (Flight 3407) was hired, he only had 600 hours of flight experience. He did not disclose previous multiple failed check rides and Colgan Air failed to look far enough into his background to see his multiple failed check rides. His lack of airmanship and foundational flying skills continued after Colgan Air hired him. Marvin Renslow was hired at a time when Colgan Air was rapidly expanding. Economic pressures were driving their accelerated hiring of pilots, including pilots like Marvin Renslow, who had far fewer hours of experience and less vetting. Economic pressure to get and keep flights in the air continued and was one of the reasons Marvin Renslow was both hired and retained at Colgan, even promoted, despite several additional failed check rides. The system at the time allowed for his career to progress, rather than restrict further advancement. He should have washed out. At the National Transportation Safety Board hearings investigating the crash, Colgan management testified they would not have hired him knowing what they learned after the crash. The requirements put in place by the Airline Safety Act of 2010 for an Airline Transport Pilot certification now require an elevated demonstration of both written and actual flying skills, as well as an increase in the number of hours, and the type of hours of experience and provide a more comprehensive record of pilot training and experience. These requirements serve as a check against an airline succumbing to economic pressures to hire pilots with less experience and training, which could put passenger safety at risk. It is the enhanced hours and experience required, as well as more stringent testing requirements for an ATP certification today, that have made this the safest period in U.S. airline history.

It should be noted that prior to the Airline Safety Act of 2010, the major Part 121 U.S. airlines required far more than 1500 hours of flying experience before hiring. Their requirement for several thousand hours of experience to be considered for hire was reflected in their safety record. The last 6 fatal crashes, including the crash of Continental Flight 3407, were all on Regional Airlines. The now lengthy safety record which includes both Regional and Major Part 121 airlines since the Airline Safety Act of 2010, is a testament to the enhanced and higher First Officer Qualifications, Pilot Training, Safety Management Systems, Flight and Duty time, and Pilot Record Database, which are the keystones, working together, building the stellar safety record in Part 121 Major and Regional airlines today.

Also, included in the hearing was testimony and discussion requesting more hourly credit for flight simulator experience to be given toward attaining an ATP or RATP certificate. Mr. Brad Thress (President & CEO—Flight Safety International) explained simulator technology and expressed his belief that the technology can provide virtual experience in different environmental and mechanical scenarios which pilots might encounter, without risk of personal harm or aircraft damage. Simulator costs are approximately $12 million dollars each, which he claims will result in a more cost-effective option for new pilots versus flying real planes. However, during questioning about the ability of simulators to duplicate all elements of the flying experience, he admitted there are critical sensory and tactile elements that the technology is unable to replicate. That same understanding was considered by FAA during the development of the upgraded ATP and RATP certificate which do include up to 100 hours of credit for certain flight simulator flying.

We also recognize professional pilots Captain Chesley Sullenberger and First Officer Jeff Skiles (now Captain) of "Miracle on the Hudson," who have said the FAA got it right when developing the new ATP and RATP certificate. Both have publicly commented that there is no replacement for the experience a new pilot gains every time he or she flies an aircraft. The Families of Continental Flight 3407 do *NOT* support any changes to credits for simulator flying experience towards qualification for an ATP or RATP certificate.

An area of consideration discussed at the Hearing that the Families of Continental Flight 3407 do support is the development of more pathways for future aviation employees to start a career. We support the providing of financial assistance to help manage the training expenses to enter these occupations. Ideas like aviation job fairs, airline industry/ high school career days, air shows etc. are all good avenues to highlight jobs in the aviation sector. Availability of grants, low interest loans, G.I. Bill modifications, 529 plan adjustments etc. are good proposals to help manage education expenses. These are worthy of more consideration in the pending FAA reauthorization bill.

Sincerely,

THE FAMILIES OF CONTINENTAL FLIGHT 3407.

Press Release of April 19, 2023, from the Transportation Trades Department, AFL–CIO, Submitted for the Record by Hon. Rick Larsen

April 19, 2023

TRANSPORTATION LABOR REAFFIRMS SUPPORT FOR PILOT TRAINING RULES

WASHINGTON—Greg Regan and Shari Semelsberger, President and Secretary-Treasurer of the AFL–CIO Transportation Trades Department (TTD), released this statement as the House Aviation Subcommittee holds a hearing on "FAA Reauthorization: Examining the Current and Future Challenges Facing the Aerospace Workforce (https://transportation.house.gov/calendar/eventsingle.aspx?EventID=406262)":

"Today, the nation's largest transportation labor federation, representing 37 unions and millions of workers across aviation and other transport industries, reaffirms our support for the United States' current pilot training and First Officer Qualification Rules, including the 1500 hour rule, and oppose moving from experiential or real flying time to simulator-based training.

"Some stakeholders in the aviation industry are using the specter of a fictitious pilot shortage in an attempt to weaken U.S. pilot training standards. To be clear: there is no shortage of pilots. According to the Federal Aviation Administration (FAA) data released today, pilot production remains strong. It is imperative that Congress put the safety of passengers and aviation workers first and reject any calls to weaken these standards.

"Following the fatal Colgan Air crash in 2009, Congress unanimously passed the Airline Safety and FAA Extension Act in 2010, which mandated new pilot experience, training, and qualification requirements. Now, special interests in Washington are seeking to weaken these safety requirements so they can hire less qualified aviators for lower pay and benefits.

"The current pilot training and qualification requirements have led to a 99.8 percent reduction in airline passenger fatalities since their enactment in 2010. In the two preceding decades there were more than 1,100 passenger fatalities.

"The United States is the gold standard for aviation safety. We cannot afford to go backwards on safety and endanger the lives of the flying public."

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APPENDIX

QUESTION FROM HON. GREG STANTON TO FAYE MALARKEY BLACK, PRESIDENT AND CHIEF EXECUTIVE OFFICER, REGIONAL AIRLINE ASSOCIATION

Question 1. The FAA has acknowledged it is experiencing an air traffic controller shortage and to address it, at least in the short-term, has asked the airlines to reduce flights in some of the nation's busiest airspace to avoid delays and cancellations during the peak summer season. Can you discuss how the airlines are being impacted by the shortage of air traffic controllers?

ANSWER. Another workforce shortage that is constraining the regional airline industry is the shortage of air traffic controllers. The controller workforce must be adequately staffed to minimize delays and disruptions to passengers. This summer, the FAA asked all major airlines to reduce service by 10 percent at LaGuardia, Kennedy, and Reagan National Airport because of a controller shortage at the New York Terminal Radar Approach Control (NY TRACON) facility. As of 2022, regional airlines were responsible for 52 percent of the departures at Reagan, 46 percent of the departures at LaGuardia, and 18 percent of the departures at Kennedy. To compensate for these cuts, major airlines have decreased the number of regional aircraft flights to transport the same or more passengers on mainline narrowbody aircraft. This is the same response that major carriers have taken with the pilot shortage, and like the pilot shortage, the impact of the controller shortage at the NY TRACON will fall disproportionately on passengers from small communities. These passengers will endure reduced convenience, and more frustration and hardship when disruptions and delays occur amidst fewer flight options to set things right.

QUESTION FROM HON. GREG STANTON TO SHARON B. DEVIVO, ED.D., PRESIDENT, VAUGHN COLLEGE

Question 1. The drone industry is expected to create a large number of new manufacturing, software, and pilot jobs, but it is also expected to change the current workforce. To help build the next generation workforce and upskill our existing one, I have focused on establishing a federal grant program to support the higher education institutions that have been designated under the FAA's UAS Collegiate Training Initiative. What role can new airspace entrants, such as drones and advanced air mobility, play in helping the U.S. build and maintain a strong pipeline of aviation professionals?

ANSWER. Thank you for the opportunity to answer this great question. New airspace entrants should connect to their local community colleges, Minority-Serving Institutions, and other colleges and universities to become part of their Industry Advisory Councils (IAC). IACs help influence curriculum and program/certificate/degree development. Most institutions have these, particularly as part of technical and/or engineering departments. Higher education wants and needs industry input to best prepare their students for the careers of the future. Those new entrants will want to consider employer engagement on campus through the career services office to raise awareness about their opportunities. These companies should consider internships, co-ops, job shadowing and apprenticeships also as awareness-building and a gateway to new talent. Congress could also "inspire" this action by expanding funding for grant programs that require industry and higher education to work together on pathways that support emerging careers.

Please feel free to reach out if I can provide further information or assistance.

QUESTION FROM HON. GREG STANTON TO CAPT. JASON AMBROSI, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

Question 1. The FAA has acknowledged it is experiencing an air traffic controller shortage and to address it, at least in the short-term, has asked the airlines to reduce flights in some of the nation's busiest airspace to avoid delays and cancellations during the peak summer season. What has been the impact on pilots of the air traffic controller shortage?

ANSWER. The controller shortage has reduced our ability to operate aircraft in airspace and created visible strains on the safety of flights. Pilots rely on air traffic control to provide data, instructions, clearance for the airspace, support for takeoffs, landing, climbs and descents, among other valuable information. The lack of sufficient controllers impedes all of these core functions of flying. As such, we support the House FAA bill's inclusion of max hiring targets.

QUESTIONS FROM HON. TROY E. NEHLS TO CAPT. JASON AMBROSI, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

Question 1. ALPA provided statistics citing 9,491 new ATP certificates were issued in 2022. However, it is not clear whether these numbers represent a reliable trend that can be relied upon. It also appears that there are a large portion of foreign pilots who seek training in the U.S. and return to other countries to fly. The FAA has averaged approximately 6,700 ATP certificates per for the last 10 years. Over the last 3 years, even with the spike seen in 2023, the average is still 1,652 below average. Does the number of ATP certificates issued in 2022 incorporate backlogs associated with training disruptions during the pandemic? Have these backlogs all been cleared? How many of the 2022 ATP certificates were issued to foreign pilots? Does ALPA have a position on the U.S. issuing visas to allow foreign pilots to fly on U.S. carriers?

ANSWER. A response was not received at the time of publication.

Question 2. Captain Ambrosi, you stated that raising the pilot age limit will result in an excessive number of training cycles due to international age limits. However, not all pilots who are facing forced retirements are on widebody international routes—a large portion are already flying domestic routes that would not result in disruptions or additional training. Further, many widebody aircraft fly both domestic and international routes, and automated scheduling algorithms can easily accommodate scheduling pilots over 65 on domestic-only routes. In the event that a pilot is forced to down bid to a domestic only aircraft, it would require as few as 2 training events for all positions to be filled. In contrast, if the same pilot retires, up to 13 training events are triggered due to pilots bidding up, further exacerbating training backlogs. Therefore, raising the pilot age would actually reduce the number of training cycles. What proportion of pilots who will be forced to retire over the next two years are currently flying domestic-only aircraft? What proportion of widebody routes are domestic? If ALPA's argument is that training slots should be reserved for pilots who will be in the system longer, should Congress consider raising the age limit to 70 or higher to add additional benefit?

ANSWER. A response was not received at the time of publication.

Question 3. This past fall, the International Air Transport Association—representing more than 300 airlines around the world that are responsible for more than 84% of air transport—requested that ICAO revisit raising age limits that constrain the ability of the aviation industry to recover from the pandemic and that represent unnecessary barriers to employment and serve as de facto discrimination. IATA further justified the request, stating, "The continued upward trend in life expectancy, associated with a decline in the likelihood of sudden pilot incapacitation, together with extensive pilot incapacitation awareness training, the use of modern simulators to train and assess pilots' performance, and the increase and availability of flight deck automation are expected to have further reduced the residual risk of pilot incapacitation." While no timeframe for completion has been identified, ICAO has indicated that it is currently gathering best practices used by the nine member countries that currently allow flying above age 65 and will be considering these in conjunction with current performance and safety data. What evidence does ALPA have to support the statement that ICAO would require a multi-year study before it will consider raising age limits? As a Member State, can the U.S. request that ICAO consider a resolution to raise age limits at an international level?

ANSWER. A response was not received at the time of publication.

Question 4. Due to the unprecedented number of forced age 65 retirements affecting senior pilots at U.S. major airlines, carriers have increased hiring and promotion of pilots in record numbers. This has resulted in a number of pilots with only one year of experience being awarded Captain positions, including awards to widebody aircraft. Some of these pilots have limited experience as pilot-in-command of transport category aircraft. Does ALPA agree that there has been an increase in FSAP/ASAP incident reporting, and does ALPA consider this a safety concern? Given that there is a positive correlation between experience and safety—and that ALPA has stated that there is no substitute for experience—do younger, less experienced pilots provide a safer operating environment and less exposure to risk than experienced pilots who are between the ages of 60 and 67?

ANSWER. A response was not received at the time of publication.

Question 5. During testimony, you made the statement that European regulators recommended against raising the age limits. This statement is false. The study ALPA cites was conducted by an outside organization, and the first page of the report states that the opinions expressed are those of the organization and that the "views expressed in the study have not been adopted, endorsed, or in any way approved the European Aviation Safety Agency." Subsequent to the report, materials from an ICAO workshop held in May 2019 state that the European Aviation Safety Association (EASA) was considering an increase of the pilot age for multi-pilot CAT operations with additional tests to support aeromedical decisions about a pilot's fitness to fly on an individual basis. "Next steps" for moving forward were also identified. A final decision had not been made, and aviation operations were subsequently disrupted by the pandemic. A 2020 publication by one of the authors of the report states that standardized risk assessments identified in the study can be used to allow EU pilots to fly above age 65 in multi-crew operations. What evidence does ALPA have that EASA currently opposes or has taken a formal position against raising the age limits above age 65 for pilots in multi-crew commercial operations?

ANSWER. A response was not received at the time of publication.

Question 6. The report ALPA referenced did not state that raising the age limit for pilots in multi-crew operations on an incremental basis, such as from 65 to 67 or 65 to 70, would introduce a statistically significant level of risk. Is there any research that indicates there would be a statistically significant increase in risk associated with raising the pilot age limit from age 65 (current age limit) to age 67 (proposed age limit)?

ANSWER. A response was not received at the time of publication.

Question 7. Has the FAA objected in any manner to raising the pilot age to 67?

ANSWER. A response was not received at the time of publication.

Question 8. The Equal Employment Opportunity Commission (EEOC) has expressed a longstanding concern about any mandatory age limit for pilots under the Age Discrimination in Employment Act of 1967 (ADEA). In 2006, the EEOC supported legislation to raise the pilot age limit from age 60 to 65 for a "specified time period" and as an "interim step" toward "eliminating age as a determinative factor in the employment of airline commercial pilots." In the 15 years since that legislation was passed, despite data showing that raising the age limit did not compromise safety, there has been no movement toward aligning regulations regarding the age limit with Federal law.

In the absence of data demonstrating a safety risk, and given the objective of Federal law under the Age Discrimination in Employment Act to prevent disadvantaging older workers in their efforts to retain employment and prevent setting arbitrary age limits that contribute to disadvantaging older workers, is ALPA willing to change its position and support an increase in the age limit for Part 121 pilots, as it did in 2007?

ANSWER. A response was not received at the time of publication.

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