



May 2018

COLLEGIATE AVIATION SCHOOLS

Stakeholders' Views on Challenges for Initial Pilot Training Programs

Accessible Version

GAO Highlights

Highlights of [GAO-18-403](#), a report to congressional addressees

Why GAO Did This Study

Collegiate aviation schools are one pathway for initial civilian pilot training in the United States and are a key source of airline pilots. Over the past 5 years, aviation stakeholders have voiced concerns that there is an insufficient supply of qualified airline pilots, citing increased airline pilot retirements, among other factors.

The explanatory statement accompanying the Consolidated Appropriations Act of 2017 included a provision for GAO to review aspects of collegiate aviation schools' operations. This report examines: (1) what is known about schools with professional pilot degree programs and (2) challenges that affect schools' ability to produce professional pilots and schools' responses to these challenges.

GAO reviewed relevant statutes, regulations, and documents from the FAA, Veterans Affairs, and Education; analyzed FAA's data on flight schools, airports, and pilots; and analyzed Education's degree completion data for the 2015–2016 academic year, the most recent data available. GAO also interviewed representatives from: 18 schools, selected based on factors including program type and location; 6 airports selected based on type and location; and 11 additional aviation stakeholders representing schools, airlines, pilots, airports, and flight instructors, selected to reflect a range of perspectives about initial pilot training. The results of the interviews are not generalizable to all aviation schools and stakeholders. GAO is not making recommendations in this report. On a draft of the report, DOT provided technical clarifications, which GAO incorporated as appropriate.

View [GAO-18-403](#). For more information, contact Andrew Von Ah at (202) 512-2834 or vonaha@gao.gov.

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What GAO Found

GAO identified 147 collegiate aviation schools that offered professional pilot degree programs in academic year 2015–2016. All pilot students must pass the same knowledge and flight tests to obtain pilot certificates from the Federal Aviation Administration (FAA), but schools' programs vary. For example, 101 of these schools operated relatively more formalized, FAA-certificated degree programs. The other 46 schools operated under a model that provides flexibility and meets FAA requirements but that does not require FAA certification to conduct such training. Total annual pilot-student enrollment and graduation numbers are not known. According to FAA officials, FAA does not require schools to submit enrollment data and does not verify enrollment data that many certificated schools voluntarily submit. Regarding graduation data, schools must classify and report completed degrees by program type to the Department of Education (Education) using that agency's classification system. Education's data indicated a total of 1,356 professional pilot degrees in academic year 2015–2016. Because pilot-student graduates can be classified under a number of aviation-related programs in Education's system, the number of pilot-student graduates could be higher.

Flight instructor retention, which has been influenced by the current high demand for airline pilots, and the high cost of pilot training are key challenges that affect schools' ability to produce pilots, according to aviation stakeholders GAO interviewed.

- **Flight instructor retention:** Nearly all (16 of 18) selected school representatives cited difficulty recruiting and retaining flight instructors as a great or moderate challenge for schools' ability to train pilots. According to most school representatives (15) and other selected stakeholders, instructors who aspire to be airline pilots are rapidly accruing the flight hours necessary to qualify and are obtaining employment as soon as they are eligible. In addition, regional airlines have recently increased hiring, generating high turnover among flight instructors, who are traditionally their main source of new pilots.
- **High cost of training:** Nearly all (16) selected schools' representatives identified the cost of a professional pilot degree program as a great or moderate challenge to recruiting and retaining pilot students. High education costs are not unique to these programs. Nonetheless, in addition to tuition, flight training fees alone often exceed \$50,000, well above the cap for federal financial aid available to eligible students.

Schools and regional airlines have taken a range of actions to address these challenges. For example, eight selected school representatives reported increasing flight instructors' compensation and benefits. In addition, some regional airlines' cadet programs provide mentorship and incentives such as bonus pay or tuition reimbursement to select students while they are still in school. The Department of Transportation (DOT) has also launched an initiative to assess the level of interest among veterans in becoming pilots and to examine strategies for employing military veterans as pilots.

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Abbreviations

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| AABI | Aviation Accreditation Board International |
| ATP | airline transport pilot |
| CFI | certified flight instructor |
| CIP | Classification of Instructional Programs |
| Education | Department of Education |
| FAA | Federal Aviation Administration |
| IPEDS | Integrated Postsecondary Education Data System |
| R-ATP | restricted-privileges airline transport pilot |
| SAA | state approving agency |
| VA | Department of Veterans Affairs |

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May 15, 2018

Congressional Addressees

The aviation system is an important part of the United States' economy and the airline industry is a key provider of domestic and international mobility for passengers and cargo. Over the past 5 years, aviation stakeholders have voiced concerns that there is an insufficient supply of available and qualified pilots to support current and future demand from U.S. regional and mainline airlines.¹ Many have cited the increased rate of airline pilot retirements and first officer airline pilot qualification requirements,² among other factors contributing to the current tight labor market for professional pilots.

We have previously reported on issues related to pilot supply and demand. In 2014, we found that, among other things, the number of pilot certificate holders—those individuals who have completed pilot training and passed Federal Aviation Administration's (FAA) pilot certification requirements³—decreased about 1 percent from 2000 through 2012, while the growth rate for pilots' employment decreased by 12 percent in that period.⁴ In addition, available evidence suggested that by 2012 fewer students were entering and completing pilot training programs since 2001 and that regional airlines reported difficulties finding sufficient numbers of qualified airline pilots. Recently, some regional airlines, which are

¹ Mainline airlines provide domestic and international passenger and cargo service on large aircraft. Regional airlines provide domestic and limited international passenger service, generally using aircraft with fewer than 90 seats, and cargo service to smaller airports.

² In commercial aviation, the captain (pilot-in-command) of an aircraft is the person aboard the aircraft who is ultimately responsible for its operation and safety during all phases of flight, as well as when it is operating or moving on the ground, in accordance with FAA's regulations. 14 C.F.R. § 91.3. The first officer (second-in-command) is the second pilot of an aircraft and has the authority to assume command of the aircraft if the captain is incapacitated. However, control of the aircraft is normally shared equally between the captain and first officer during flight.

³ 14 C.F.R. Part 61 prescribes the minimum training, knowledge, and experience requirements for acquiring a pilot certificate.

⁴ GAO, *Aviation Workforce: Current and Future Availability of Airline Pilots*, [GAO-14-232](#) (Washington, D.C.: Feb. 28, 2014).

particularly reliant on newly trained pilots, have been reducing flights and eliminating routes to some markets, reportedly due to lack of qualified pilots.

Collegiate aviation schools with professional pilot degree programs are a key source of new commercial pilots.⁵ These programs have been generally perceived by aviation industry stakeholders as providing a high level of civil aviation pilot training because they are designed to produce professional pilots for airlines. In addition, airlines generally prefer to hire pilots with college degrees, reportedly because they perform better in an airline's training program when hired.

The explanatory statement accompanying the Consolidated Appropriations Act of 2017 included a provision for us to review certain aspects of collegiate aviation schools' operations.⁶ This report addresses:

- what is known about collegiate aviation schools with professional pilot degree programs in terms of location, types of training programs available, and enrollment, and
- challenges that affect collegiate aviation schools' ability to produce professional pilots and schools' response to these challenges.

To determine what is known about collegiate aviation schools we analyzed several sets of data. Specifically, to identify schools that operated pilot programs for fixed wing aircraft in academic year 2015–2016 and the airports at which they operated, we obtained and reviewed FAA's data on pilot schools that had received certification from FAA to operate, as of August 19, 2016. We also obtained and reviewed school information from two industry associations and school websites.⁷ These

⁵ As we have previously reported, airline pilots are mostly trained through (1) FAA-certificated collegiate aviation schools—typically through 2- and 4-year professional pilot degree programs at a college or university—(2) FAA-certificated non-collegiate schools, or (3) the military. Pilot schools not certificated by the FAA, which are primarily instructor-based schools predominately train students interested in recreational flying. See GAO, *Initial Pilot Training: Better Management Controls Are Needed to Improve FAA Oversight*, [GAO-12-117](#) (Washington, D.C.: Nov. 4, 2011). This report discusses the various types of pilot schools in the United States and oversight of these schools, pilot examiners, and flight instructors—those mainly involved with the training of pilots.

⁶ Pub. L. No. 115-31, 131 Stat. 135 (2017).

⁷ We did not study aviation programs such as rotorcraft (e.g., helicopters) or other, non-flight aviation majors such as air traffic control or aviation maintenance because they are generally not suited for becoming commercial airline pilots.

data were the most applicable given the academic year we reviewed. To determine what is known about the types of programs available at these schools, we analyzed the Department of Education's (Education) data on institution type, college-wide tuition and fees, and graduations in academic year 2014–2015 (the most recent year available). To determine what is known about enrollment at collegiate aviation schools, we analyzed enrollment and certificated flight instructor⁸ data voluntarily reported to FAA by some schools between October 2015 and October 2017.⁹ We also analyzed FAA's pilot data to identify, for a number of categories, the number of new pilot certificates FAA issued from 2012 through 2016 and the total number of pilot certificate holders for those years.¹⁰ We reviewed documents and interviewed Education and FAA agency officials, as well as representatives of industry associations and an accreditation entity to determine that these data were the most complete sources available. While these data were limited, we determined that they were sufficiently reliable for the purposes of our reporting objectives.

To determine challenges that affect collegiate aviation schools' ability to produce professional pilots, we reviewed federal laws and regulations pertaining to pilot requirements and FAA's oversight of collegiate aviation schools' pilot programs and interviewed FAA officials. We reviewed documents and interviewed a non-generalizable sample of 18 collegiate aviation schools about their pilot programs and key challenges that affect their ability to produce professional pilots. We selected these schools to represent a mix in terms of geographic location, institution type, program type, and estimated enrollment where that information was available. While the sample allowed us to learn about challenges that affect these schools' ability to produce professional pilots, it was designed to provide anecdotal information, not findings that would be representative of all

⁸ The holder of a valid flight instructor certificate may provide pilot training and instruction for pilot certification in any aircraft for which they are qualified. 14 C.F.R. § 61.193.

⁹ FAA's Part 141 pilot school regulations prescribe the requirements for issuing pilot school certificates and the general operating rules applicable to a holder of the certificate. Collegiate aviation schools operating under pilot school regulations voluntarily report enrollment and flight instructor employment data. FAA collects the data on an on-going basis, but does not audit the data to verify accuracy.

¹⁰ FAA does not proactively purge deceased certificate holders from its airmen database; however, deceased certificate holders in certain categories will be deactivated if they do not renew their medical certificate when it expires and all certificate holders are deactivated at age 90.

collegiate aviation schools. We also reviewed documents from additional stakeholders and interviewed them, including representatives of 6 selected airports where collegiate aviation schools operate and 11 industry organizations representing collegiate and non-collegiate pilot schools, airports, flight instructors, pilots, regional airlines, and mainline airlines. In addition, we reviewed documents and interviewed Education and Department of Veterans Affairs (VA) officials about regulations and policies related to pilot programs' eligibility for federal student financial aid and the use of veterans' education benefits. Further details about our scope and methodology can be found in appendix I.

We conducted this performance audit from September 2016 to May 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Civil aviation in the United States can be generally divided into two broad categories—general aviation and commercial aviation. All civilian pilot students undergo their initial pilot training in the general aviation sector, which comprises all aviation activities other than military and commercial airlines. Once hired in the commercial aviation sector for businesses that carry passengers or cargo for hire or compensation, pilots may receive additional, employer-specific training.

FAA is responsible for regulating the safety of civil aviation in the United States, including the administration of pilot certification (licensing) and conducting safety oversight of pilot training.¹¹ Regulations for initial pilot training and certification are found in two parts of the Federal Aviation

¹¹ FAA is also responsible for ensuring safety at airports where collegiate aviation schools conduct flight training. 14 C.F.R. Part 139.

Regulations—pilot training requirements¹² and requirements for obtaining a pilot school certificate.¹³

- *Pilot training requirements:* These regulations prescribe the minimum training, knowledge, and experience requirements for acquiring a private, commercial, or airline transport pilot certificate, and for becoming a certificated flight instructor (CFI). Individual flight instructors can provide pilot training to individuals under these regulations and the training is not subject to direct FAA oversight beyond the initial flight instructor certification and subsequent renewal.¹⁴
- *Requirements for obtaining a pilot school certificate:* These regulations prescribe requirements pilot schools must meet to obtain an FAA certificate and the general operating rules applicable to a school's holding a certificate. FAA-certificated schools are required to meet prescribed standards with respect to training equipment, facilities, student records, personnel, and curriculum. Schools' pilot program curriculum can vary in content, but FAA provides core training guidelines that schools must follow to receive a certificate. To ensure safety, FAA requires its inspectors to conduct on-site inspections of each FAA-certificated school at least once a year, focusing on pilot school operations and training aircrafts' airworthiness.¹⁵

Schools that provide initial pilot training generally fall into three categories: (1) collegiate aviation schools, (2) non-collegiate vocational pilot schools, and (3) non-collegiate, instructor-based pilot schools.¹⁶ Collegiate aviation schools that provide initial pilot training typically offer a 2- or 4- year undergraduate degree in an aviation-based major along with the pilot certificates and ratings necessary to become a commercial pilot.

¹² 14 C.F.R. Part 61.

¹³ 14 C.F.R. Part 141.

¹⁴ FAA may inspect flight instructors' operations when a triggering event occurs, such as an aircraft accident.

¹⁵ Per FAA requirements, its school inspections must cover the school's facility and student records, aircraft, and compliance with FAA's airworthiness directives. 14 C.F.R. § 141.21.

¹⁶ Non-collegiate flight-based schools can be either an individual for-hire flight instructor operating as a single-instructor school at a local airport, or a more traditional training school with a small physical facility located at a particular airport.

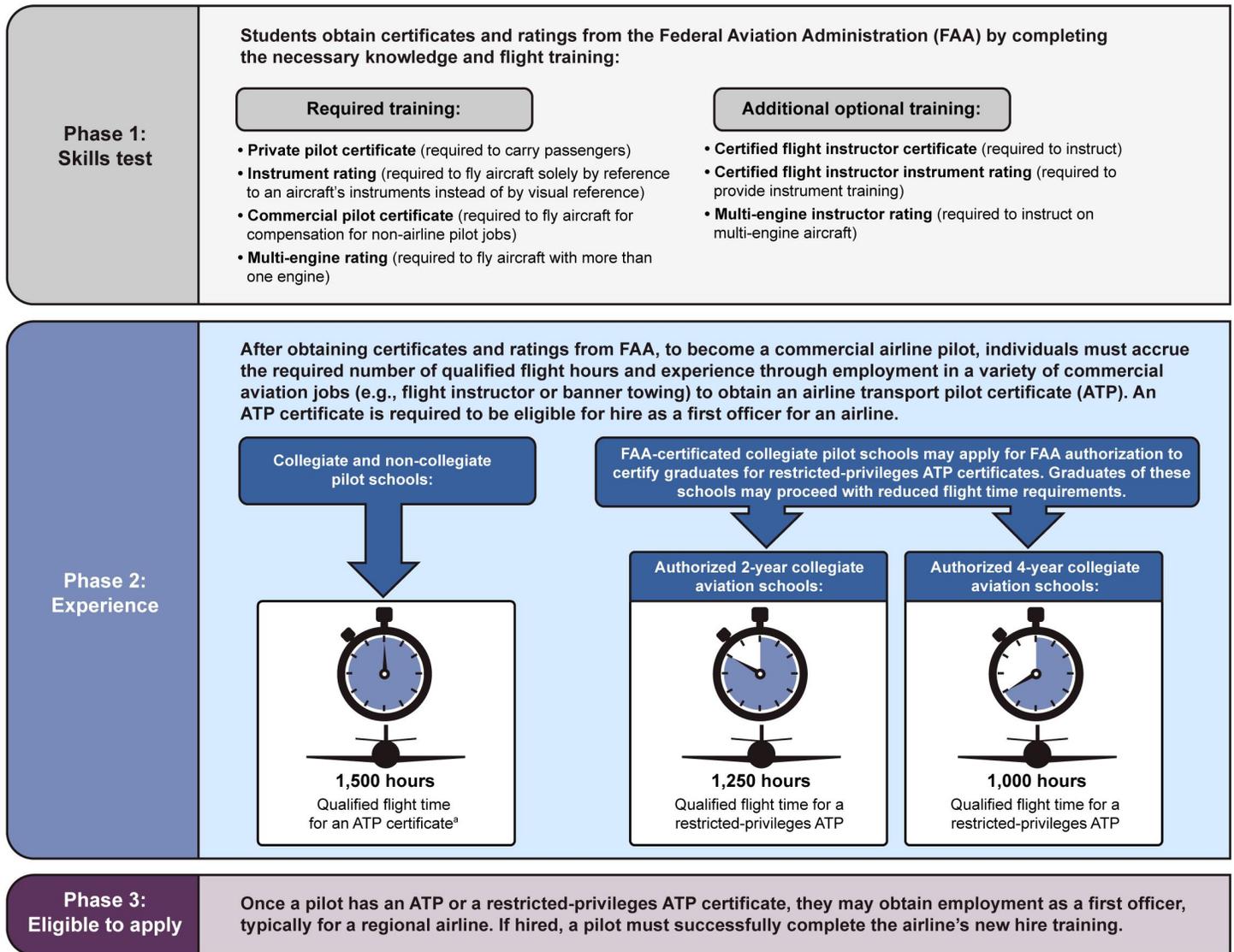
All pilot schools must comply with FAA's pilot training requirements, but some may elect to become FAA-certificated as well. Instructor-based schools offer flexible training environments where the training sequence can be altered to meet specific students' needs and time commitments. Upon completion of the training, the students can obtain pilot certificates for which they were trained, as long as they pass FAA's tests. FAA-certificated vocational schools do not allow flexible training environments as the training sequence outlined in the curriculum cannot be altered. FAA requires annual inspections of these schools, unlike flight instructor-based schools.

As we have previously reported, it takes years of training to meet FAA's certification and aeronautical experience qualifications to become an airline pilot.¹⁷ Once cleared by a medical examination, an individual may obtain a medical certificate and a student pilot certificate from FAA.¹⁸ Pilot students may then begin training, acquiring the knowledge and flight training to obtain a private pilot certificate, instrument rating, commercial pilot certificate, and multi-engine rating (see fig. 1).

¹⁷ [GAO-14-232](#). 14 C.F.R. Parts 61, 141, 142.

¹⁸ To be eligible for a student-pilot certificate, an applicant must be at least 16 years and hold at least a third-class medical certificate. Medical certificates are designated as first-class, second-class, or third-class. Generally, first-class is designed for the airline transport pilot; second-class for the commercial pilot; and third-class for the student, recreational, and flight instructor. 14 C.F.R. §§ 61.23, 61.83, and 61.89.

Figure 1: Initial Pilot Training Pathways to Become a Commercial Airline Pilot



Source: GAO and GAO presentation of information contained in Part 61 and Part 141 of Title 14 of the U.S. Code of Federal Regulations. | GAO-18-403

To be eligible for hire as either a captain or first officer for an airline, individuals must also obtain an airline transport pilot (ATP) certificate in addition to the other certificates and ratings. In July 2013, FAA began requiring all first officers to have an ATP certificate, which requires 1,500 hours of flight experience.¹⁹ Pilots with fewer than 1,500 hours can obtain a “restricted-privileges” ATP certificate (R-ATP), under which specific academic training courses can count toward the required hours of total flight time.²⁰ FAA made this change for airline first officers following the 2009 Colgan Air Inc. crash in New York,²¹ and subsequent legislation that required FAA to modify, among other things, first officer qualifications.²² In our 2014 report, FAA and industry stakeholders estimated that it could take an additional 1 to 2 years for pilots coming out of school to meet the 1,500 hour requirement.

Consistent with airline representatives’ views from our prior report, regional airline association representatives have recently cited the revised first officer training requirements and several other factors as contributing to a tight pilot labor market. By increasing the minimum number of required flight hours for a first officer, entry into the airline pilot profession may take longer, which may decrease the pool of eligible pilots that mainline and regional airlines can hire as a first officer. In addition, as we previously reported, the civil aviation industry has been a historically volatile industry because demand for air travel is sensitive to economic conditions, as well as political, international, and even health-related events.²³ After several years of industry contraction during the 2007-2009 economic recession, demand for air travel has increased since 2012, and FAA projects continued future growth.²⁴ In addition, since 2014, pilot

¹⁹ Previously, pilots with commercial pilot certificates were permitted to fly as first officers for regional and mainline airlines. To obtain a commercial pilot certificate a pilot is required to have a minimum of 250 hours of qualified flight time, among other things.

²⁰ 14 C.F.R. § 121.436.

²¹ 78 Fed. Reg. 42324 (July 15, 2013).

²² The Airline Safety and Federal Aviation Administration Extension Act of 2010 mandated that FAA further limit the hours of pilot flight and duty time to combat problems related to fatigue and that FAA increase training requirements and pilot qualifications for first officers. Pub. L. No. 111-216, §§ 216 and 217, 124 Stat 2348, 2366 (2010).

²³ See GAO 14-232.

²⁴ FAA forecasts 1.9 percent average annual increases in U.S. airline passengers from 2017 through 2037. FAA’s forecast also reports that the total number of domestic departures rose in 2016 for the first time since 2007, but still remains 17.3 percent below the 2007 level. FAA, *FAA Aerospace Forecast Fiscal Years 2017-2037*.

retirements have been increasing, further tightening the labor market, according to one study.²⁵ That study forecasts between 2,000 and 3,000 annual mandatory age retirements from the mainline airlines between 2018 and 2021. According to the Bureau of Labor Statistics, most of the newly hired pilots in the next 10 years will be replacing retiring pilots.

While Some Information on Collegiate Aviation Schools' Pilot Degree Programs Is Available, Enrollment and Graduation Data are Limited

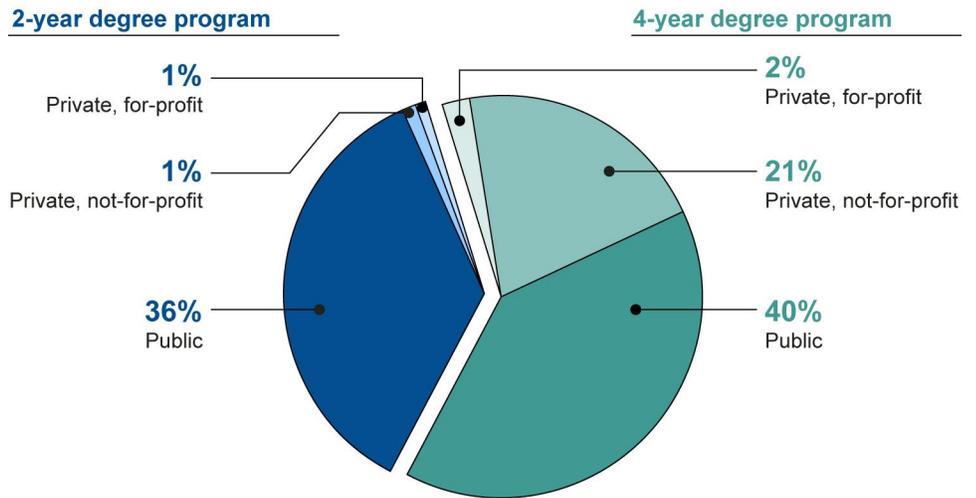
Collegiate Aviation Schools Are Located across the Country and Offer Different Types of Pilot Degree Programs

We identified 147 U.S. colleges and universities that offered at least one professional pilot degree program in academic year 2015-2016. These collegiate aviation schools are located throughout the country, as shown in figure 2. They may offer pilot programs within different academic departments, such as aviation or business. Within a department, pilot programs may be offered as a stand-alone program, as an integral part of a larger major, such as flight education or aviation management, or as a specialty or track within a major.

²⁵ See McGee, "Air Transport Pilot Supply and Demand, Current State and Effects of Recent Legislation." (PhD diss., Pardee RAND Graduate School, 2015) On July 15, 2009 FAA, implementing federal law, finalized a rule on raising the mandatory retirement age for pilots serving in domestic, flag, and supplemental operations from 60 to 65. Fair Treatment for Experienced Pilots Act. Pub. L. No. 110-135, § 2, 121 Stat. 1450; 74 Fed. Reg. 34229 (July 15, 2009).

profits or private for-profits,²⁷ according to Education’s data (see fig. 3).²⁸

Figure 3: Collegiate Aviation Schools with Professional Pilot Degree Programs by Degree Length and School Type, Academic Year 2014–2015



Source: GAO analysis of Department of Education IPEDS data. | GAO-18-403

Notes: Percentages may not sum to 100 percent due to rounding.

Integrated Postsecondary Education Data System (IPEDS) data for academic year 2014–2015 were not available for two collegiate aviation schools we identified.

- Program degree length:** A majority of collegiate aviation schools offer 4-year degree programs, as shown in figure 3. Program degree length may affect how long it takes pilot students to meet FAA’s requirements and their career options once they complete training. For example, pilot students in 2-year degree programs may complete the program and acquire a commercial pilot certificate and ratings in less time than the 4-year degree program, which may save the students time and money. However, according to associations representing pilot training providers and pilots, mainline airlines prefer

²⁷ Public schools are generally operated by publicly elected or appointed officials. Private non-profit schools are traditionally operated by independent or religious organizations and earnings do not benefit any shareholder or individual, whereas private for-profit schools are owned and operated by private organizations and earnings can benefit shareholders or individuals.

²⁸ Academic year 2014–2015 was the most recent institution data available from the Department of Education.

pilots with a 4-year degree. In addition, representatives from one mainline airline told us that the airline requires a 4-year degree for employment as a pilot. Regardless of which school and degree program a pilot student graduates from, all pilot students must pass the same knowledge and flight tests to obtain pilot certificates and are, by FAA's standards, eligible for the same career opportunities.

- *FAA Regulations and academic curriculum:* Forty-six collegiate aviation schools we identified operate their pilot programs solely under FAA's pilot training requirements. The remaining 101 collegiate aviation schools' pilot programs are certificated by FAA under FAA's pilot school requirements.²⁹ As previously discussed, FAA-certificated schools must meet prescribed standards, have structured programs, and FAA must approve their pilot program's curriculum. In addition, each pilot program's academic curriculum may differ, though all must meet FAA's pilot training requirements and, if the school is certificated, FAA's pilot school requirements.
- *R-ATP authorization:* Only FAA-certificated collegiate aviation schools may apply to FAA for authority to certify eligible graduates for an R-ATP certificate with a reduced number of flight hours. Since FAA promulgated the new first officer qualification rule and established the R-ATP certificate in 2013,³⁰ FAA has issued R-ATP authorizations to more schools each year. As of August 22, 2017, 86 collegiate aviation schools hold R-ATP authorizations. In addition, the number of R-ATP certificates FAA has issued to eligible graduates each year has steadily increased, from 37 in 2013 to 2,190 in 2016. The number of R-ATP certificates issued in 2016 represented about 18 percent of all ATP certificates. The reduced flight-hour eligibility may save students time and money on their path to becoming a professional pilot, depending on how they gain flight experience, which may motivate more students to consider attending collegiate aviation schools that are authorized for R-ATP certificates, compared to other training alternatives.
- *Aviation Accreditation Board International accreditation:* Schools' professional pilot programs may choose to pursue program

²⁹ FAA-certificated collegiate aviation schools may also offer more flexible, less structured training to students using FAA's pilot training requirements in certain circumstances, although representatives from seven schools we spoke with said they rarely do so. Students who have prior flight training or a prior degree may prefer the more flexible, less structured training.

³⁰ 78 Fed. Reg. 42324 (July 15, 2013).

accreditation in addition to the school's institutional accreditation.³¹ Thirty-two collegiate aviation schools we identified have pilot programs accredited by the Aviation Accreditation Board International and an additional 4 schools have pilot programs that are candidates for accreditation, as of December 27, 2017.³²

The collegiate aviation schools we identified require that students complete training that includes both classroom (ground) and flight training. Ground school aims to provide students with the required aeronautical knowledge and cognitive skills necessary to perform the tasks required to become a pilot. Flight training focuses on teaching how to manipulate the controls of and safely operate an airplane. Most schools (89 of 147) conduct their own flight training using university-owned or – leased aircraft and university employed CFIs (in-house flight training). The number of CFIs employed by collegiate aviation schools varies and is one of the primary determinants of a school's enrollment capacity. The remaining 58 schools contract out their flight training to one or more pilot schools or allow students to complete their flight training at a pilot school of the student's choosing.

Schools that provide in-house flight training operate at a relatively small number of all domestic airports, which vary greatly in size as measured by annual passenger enplanements (see fig. 4). Approximately 69 percent of these schools operate at non-primary airports—those with fewer than 10,000 passenger enplanements a year. Flight training may comprise a large proportion of an airport's activity, particularly at smaller airports, according to representatives from seven schools and two airport authorities. The remaining 28 percent of the schools that provide in-house flight training operate at primary airports with over 10,000 passenger enplanements a year.³³ There are advantages to operating at small and

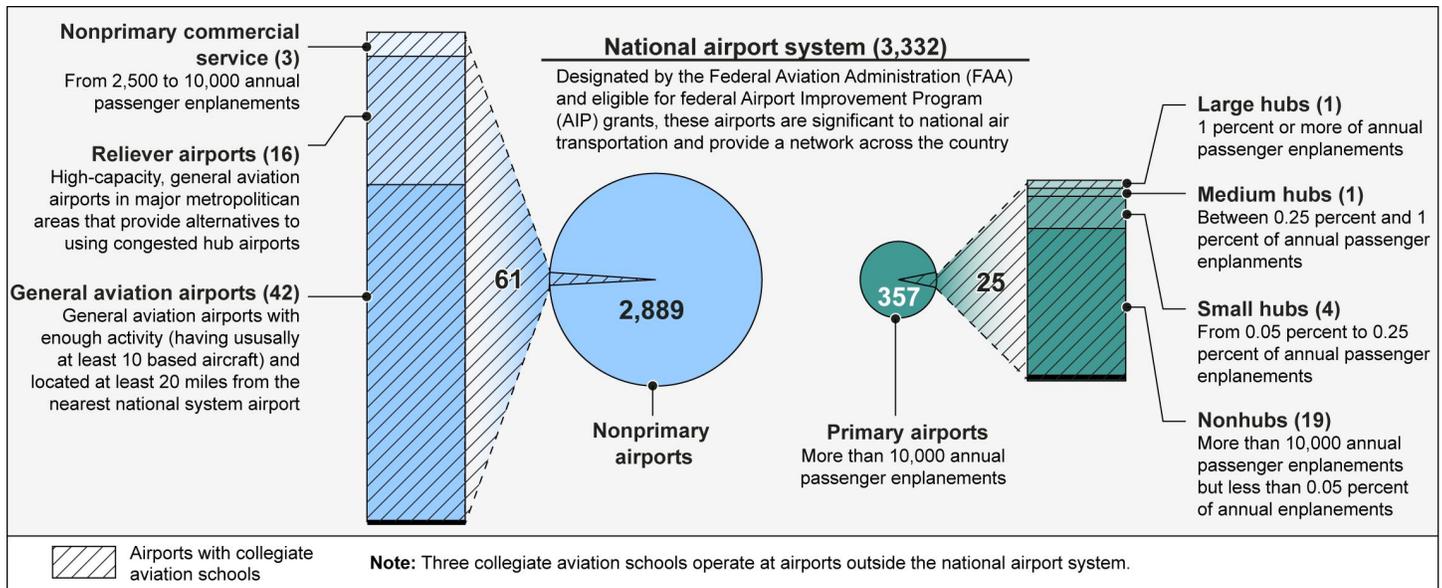
³¹ The primary purpose of accreditation is to help ensure that schools provide a quality education to students. Accreditors oversee academic quality at schools by applying and enforcing standards for the schools they accredit.

³² The Aviation Accreditation Board International (AABI) is an independent body that advances aviation education through accreditation and is the only program accreditor for collegiate, non-engineering aviation education for both 2-year and 4-year programs. Program accreditors, like AABI, review and accredit specific programs or subject area offerings within an educational institution. AABI accredited programs must be degree-granting at a nationally or regionally recognized institution.

³³ Of the 89 collegiate aviation schools that conduct in-house flight training, 3 operate at airports outside of the National Airport System. Because of this, percentages will not add up to 100%.

large airports. Representatives from three schools and five stakeholders representing flight training providers, airports, and pilots told us that operating out of smaller airports may be advantageous because they are less crowded, a condition that can save waiting time for take-offs and allows students to practice certain maneuvers that may be more difficult to perform at larger airports. Conversely, according to representatives from two schools, two pilot training provider associations, and one airport, operating at larger airports can be advantageous because students can learn to fly in the controlled environment that airline pilots will eventually fly in.

Figure 4: Types of Airports at which Collegiate Aviation Schools Provide In-house Flight Training, Academic Year 2015–2016



Source: GAO analysis of FAA data. | GAO-18-403

Pilot Student Enrollment and Graduation Data Are Limited

For several reasons, there are no comprehensive data on pilot student enrollment at collegiate aviation schools. First, because non-certificated schools are not subject to periodic FAA inspections, FAA does not collect any enrollment data for these schools. Second, enrollment data are available for only some FAA-certificated schools because reporting that data is optional for those schools during FAA’s certification and inspection

process.³⁴ In addition, FAA does not verify the data to determine their accuracy. As previously noted, FAA is responsible for regulating the safety of civil aviation in the United States. As such, according to FAA officials, FAA requires data collection when such a requirement serves a safety purpose, such as data required for pilot school certification and FAA oversight.³⁵ FAA officials told us that other data on collegiate aviation schools, such as enrollment numbers, do not serve FAA's primary safety purpose.

The size of collegiate aviation schools appears to vary greatly. Although voluntary, almost all FAA-certificated collegiate aviation schools submitted enrollment data to FAA. According to FAA's data provided to us on October 5, 2017, 92 FAA-certificated schools had reported average yearly enrollment data for their pilot programs.³⁶ Reported enrollment at these FAA-certificated collegiate aviation schools varied greatly—from 5 professional pilot students to 850. Despite this wide range, most (66) of these schools reported that they enrolled 100 students or less in their pilot programs. A majority (15 of 18) of representatives from selected collegiate aviation schools noted an increase in enrollment over the past 5 years.

Additionally, the data on graduations from professional pilot programs are not comprehensive.³⁷ Education requires schools, including collegiate aviation schools, to report how many students they graduate annually. School officials classify and report completed degrees by program type to

³⁴ While FAA requires certificated schools to maintain a monthly listing of enrollment in each training course offered, schools are not required to report enrollment to FAA. 14 C.F.R. § 141.93(b). Since FAA-certificated schools submit enrollment and certificated instructor information during each school's certification process, this enrollment information does not specify a specific academic year or time frame.

³⁵ As previously discussed, Part 141 outlines the specified personnel, aircraft, facilities, curriculum, and other operating requirements that approved pilot training organizations (schools) must meet to hold a certification from FAA.

³⁶ Since academic year 2015–2016, an additional seven collegiate aviation schools received FAA certification. Four collegiate aviation schools no longer hold FAA certification.

³⁷ Education reports the number of degrees awarded, a figure that we interpret as graduations.

Education using the agency's classification system.³⁸ One of Education's program codes—for "Airline/Commercial/Professional Pilot and Flight Crew"—appears to best capture graduates from professional pilot programs. Education's data for professional pilot degrees awarded by collegiate aviation schools under this code totaled 1,356 in academic year 2015–2016. However, of the 147 collegiate aviation schools we identified for academic year 2015–2016, 72 reported pilot student graduates using the code. This might be because collegiate aviation schools may report their pilot student graduates under other program codes, such as "Aeronautics/Aviation/Aerospace Science and Technology, General" and "Aviation/Airway Management and Operations."³⁹ According to an Education official, while the agency expects schools to provide precise reporting of graduations from each degree program, he said it is possible that some school officials may not perceive their programs consistently with Education's program classifications, despite specific definitions for each program category. Because pilot student graduates could be reported under a number of aviation-related program codes in Education's system, the number of professional pilot graduates could be higher.

According to Education's data, the number of professional pilot degrees awarded by collegiate aviation schools under the Airline/Commercial/Professional Pilot and Flight Crew code fluctuated from year to year between academic year 2010–2011 and 2015–2016. Almost half of the representatives from our selected collegiate aviation schools (8 of 18) noted increased pilot student graduations over the past 5 years. The number of these graduations could continue to increase in

³⁸ According to the Department of Education's National Center for Education Statistics, the Classification of Instructional Programs (CIP) is a coding scheme of instructional programs. Its purpose is to facilitate the organization, collection, and reporting of fields of study and degree completions (i.e., graduations). The CIP titles and program descriptions are intended to be generic categories into which degree completions data can be placed, not exact duplicates of a specific major or field of study titles used by individual institutions. The CIP is the accepted federal government statistical standard on instructional program classifications and is used in a variety of education information surveys and databases.

³⁹ Education gathers information from every college, university, and technical and vocational institution that participates in federal student financial aid programs, as well as other institutions that report data voluntarily. The department works with collegiate institutions to ensure high quality reporting. According to department officials, Education tracks graduation data for all collegiate institutions participating in federal student aid, but all collegiate institutions do not classify and report graduations for their aviation programs in a uniform manner.

the next few years since, according to representatives from seven schools, student enrollment generally responds to industry need and the perception of a more stable career pathway. According to one of these representatives, graduations increase with a lag relative to the increased industry demand and student enrollment, given the time it takes to complete the degree program. Given the observations from school representatives of increasing enrollment, graduations may continue to increase as well.

Flight Instructor Turnover, Cost of Training, and Other Factors Affect Collegiate Aviation Schools' Ability to Produce Pilots

Retaining Flight Instructors Is a Key Challenge for Collegiate Aviation Schools' Ability to Produce Pilots

Selected school and other aviation industry representatives we spoke with generally agreed that retaining and recruiting flight instructors is one of the key challenges facing collegiate aviation schools.⁴⁰ Representatives from nearly all (16 of 18) of the schools identified recruiting and retaining flight instructors as a great or moderate challenge and a majority stated that it was their greatest challenge affecting their ability to produce pilots (see app. I for a summary of the responses.). According to representatives from 3 aviation industry stakeholders, in the current environment some schools are unable to recruit and retain enough flight instructors to train all the pilots that they otherwise have the resources to accommodate in their pilot programs. To illustrate, representatives from 2 schools reported an inability to accept some qualified students because they did not have sufficient flight instructors. Meanwhile, representatives from 4 other schools said they have been able to hire enough new instructors to keep up with flight instructor attrition. In addition to presenting a management challenge, instructor turnover may hinder

⁴⁰ We spoke with representatives from 18 collegiate aviation schools to understand the extent to which a variety of factors posed a challenge to their ability to produce pilots. We asked the selected schools to rank each of the 10 factors that we identified from initial interviews as a great challenge, a moderate challenge, a slight challenge, or not a challenge to their ability to recruit, retain, and train professional pilot degree students. We also interviewed 10 aviation industry representatives about actions taken and potential future actions to address those factors.

training effectiveness. For example, one pilot association representative told us that the quality of instruction tends to be lower when students are routinely subject to new instructors since there is little instructional continuity.

Representatives of 6 of the collegiate aviation schools we interviewed said they recognize that instructor turnover is unavoidable because most pilots do not pursue flight instruction as a long-term career. Regardless, the rate of turnover in recent years has increased, according to selected school and other aviation industry representatives. As previously discussed, school representatives told us that most pilots use flight instruction as a stepping stone to accrue the required flight time to become an airline pilot, which commands a higher salary and greater prestige than flight instructor positions.⁴¹ Flight instructors generally seek employment with an airline as soon as they are eligible, according to most school representatives (15 of 18) and other stakeholders we spoke with.⁴² According to two aviation industry stakeholder representatives, the career progression of civilian-trained pilots from flight instructor to commercial airline pilot has typically worked in this way. However, stakeholders have stated that in recent years, airline industry growth, increasing pilot retirements, and other factors previously discussed have caused commercial airlines to accelerate pilot recruitment, ultimately causing pilots to move through the instructor ranks more quickly.

Regional airlines now hire qualified pilots as soon as they accrue the minimum hours required by FAA, according to representatives from one airline pilots association. According to one study, in the mid-2000s most of the larger regional airlines set minimum flight-hour requirements for first officer applicants of 800 to 1,000 hours, which were well above the FAA requirements at the time.⁴³ Furthermore, applicants needed an even

⁴¹ According to a 2015 online survey of current students and recent pilot-student graduates conducted by researchers at the University of North Dakota and the University of Nebraska at Omaha, only 2 percent of those who responded to the survey aspired to become career flight instructors, whereas 60 percent aspired to become career airline pilots.

⁴² Not only does a pilot's pay increase when they are hired by an airline, but pilots have a strong incentive to begin working for an airline as soon as possible because when they are first hired pilots receive a "seniority number," which designates their rank within the airline. That number determines when they are eligible for promotion, as well as their bidding position for route selection, work schedule, and vacation timing.

⁴³ McGee, *Air Transport Pilot Supply and Demand*.

higher number of hours to be competitive for those positions prior to that time—between 1,500 and 2,000 hours, according to representatives of a pilots' association.

Recruiting and retaining flight instructors with more advanced qualifications, such as instructors qualified to train other pilots to be flight instructors and chief instructors, can be a particular challenge for collegiate aviation schools:

- *Flight instructors qualified to train flight instructors:* FAA requires flight instructors to have a minimum 2 years of instructor experience before they may train other pilots to obtain their CFI certificate.⁴⁴ Representatives from almost half (8 of 18) of collegiate aviation schools reported challenges with retaining flight instructors long enough for them to meet that requirement. According to some school representatives, flight instructors typically accrue the minimum hours required to qualify for their ATP or R-ATP within 2 years or soon afterward. The resulting attrition of experienced flight instructors can therefore hamper schools' ability to train enough pilots to become flight instructors, an ability that is crucial for turning out the next generation of instructors and pilot students.
- *Chief Instructors:* FAA requires certificated schools to have a chief instructor who meets minimum regulatory qualifications, such as at least 2,000 hours of flight time as "pilot-in-command."⁴⁵ Representatives from two schools told us that because of high instructor turnover, few instructors meet these qualifications and the schools find it challenging to recruit qualified chief instructors.

Four school representatives and two other aviation stakeholders we interviewed noted that the revised first officer requirements have helped

⁴⁴ 14 C.F.R. § 61.195 (h)(2). In addition to holding a flight instructor certificate for at least 24 months, flight instructors must have given at least 200 hours of flight training as a flight instructor to provide training to an initial applicant for a flight instructor certificate.

⁴⁵ 14 C.F.R. §§ 141.33 (a) (1), 141.33 (b), and 141.35. The minimum qualifications for a chief instructor under Part 141 vary depending on the courses taught in the flight school's curriculum. Pilot-in-command means the person who: (1) has final authority and responsibility for the operation and safety of the flight; (2) has been designated as pilot in command before or during the flight; and (3) holds the appropriate category, class, and type of rating, if appropriate, for the conduct of the flight.

collegiate aviation schools retain flight instructors.⁴⁶ As previously discussed, these revised requirements increased the minimum number of flight hours a pilot must have to become a first officer, so instructors continue to instruct longer than they might have otherwise. The school representatives noted that while they are still experiencing high flight instructor turnover the situation would be more challenging without the new requirements. In addition, representatives from two large collegiate aviation schools stated that when there is a high demand for pilots, they would not be able to recruit and retain any flight instructors in the absence of FAA’s first officer requirements.

As shown in table 1, several of the collegiate aviation schools we interviewed have taken some actions to address the challenge of recruiting and retaining flight instructors.

Table 1: Examples of Actions Taken by Schools to Address the Challenge of Recruiting and Retaining Flight Instructors, Cited by Collegiate Aviation School Representatives

| Description of action taken | Number of schools reporting action |
|--|------------------------------------|
| Increased flight instructor compensation such as pay, tuition, and health benefits, sometimes in conjunction with full-time employment status. | 8 |
| Enhanced instructor quality of life with amenities, such as an instructor lounge. | 1 |
| Provided instructors the opportunity to train for additional ratings, such as multi-engine instructor rating, at no cost. | 4 |
| Expanded efforts to recruit instructors from outside their own student and graduate population, including broadening searches to include other pilot schools and retired pilots. | 5 |
| Focused on recruiting flight instructors who were likely to instruct for the long term, such as retired pilots from airline, military, or law enforcement careers. | 1 |

Source: GAO analysis of interviews with representatives from 19 collegiate aviation schools. | GAO-18-403

⁴⁶ According to one study, the revised first officer qualification rule may have affected the career plans of aspiring pilots. This finding is based on a survey completed by 820 recent graduates and current students of collegiate aviation programs; the study found that 8 percent of survey respondents no longer planned to fly for the airlines and 28 percent of respondents were reconsidering plans to fly for the airlines due to the revised rule. See Rebecca Lutte and Kent Lovelace, “Airline Pilot Supply in the US: Factors Influencing the Collegiate Pilot Pipeline,” *Journal of Aviation Technology and Engineering*, vol. 6, no. 1 (2016).

At least 6 regional airlines offer cadet programs, which may provide additional incentives for graduates to remain at their alma mater as flight instructors until they meet FAA's first officer qualification requirements, according to school representatives we spoke to. These programs may include incentives such as bonus pay for a number of flight hours, health benefits, or tuition reimbursement. Students who sign onto the cadet programs typically accept a provisional employment offer and are expected to work for the airline upon obtaining the number of hours necessary for the ATP certificate and completing an airline's new hire training. Representatives from two schools said that few students participated in these programs, attributing lower participation to students who may not want to commit to one airline.

In addition to actions that schools can take to retain flight instructors, school representatives suggested additional actions that would require cooperation from airlines. Representatives from one state university told us that the school negotiated an agreement with one airline to initially hire its graduates as part-time pilots, allowing the pilots to continue to work part-time as flight instructors. The school is attempting to go one step further by negotiating agreements whereby airlines will not hire its instructors until the school is ready to relinquish them. According to the school's representatives, two regional airlines have recognized that keeping instructors at the school longer could be to their benefit, increasing the school's capacity to produce more pilots that the airlines will then hire. Another school representative suggested that airlines might consider loaning out their pilots to instruct for schools, but a representative from an airline association said that airlines do not have extra personnel to spare. Representatives of a pilot school said they are working with airlines to change the seniority system so that pilots can get their seniority number while they are instructors, which could reduce the strong incentive to become an airline pilot as quickly as possible.

School representatives and a stakeholder described additional actions that could be taken to address this issue, including encouraging students to obtain their CFI, encouraging retired airline pilots to instruct, and raising the profile of the flight instructor profession as a possible career path.⁴⁷ Collegiate aviation schools may require their students to obtain a CFI to graduate. Those schools that do not require a CFI may produce

⁴⁷ Pilots with an expired CFI can reinstate all of their previously-held ratings by passing a practical test, allowing them to have the required ratings to work as a flight instructor.

fewer graduates who are qualified to instruct. A representative from one school told us that it is now encouraging students to obtain their CFI as a way to increase the number of potential flight instructors. Representatives from three industry associations said the FAA should consider changing its requirement for instructors to have 2 years instructing experience before they may train other pilots to obtain their CFIs. In addition, in 2017 the FAA Aviation Rulemaking Advisory Committee issued a report recommending that FAA permit completion of an FAA-approved standardized course at FAA-certificated schools as an alternative to the 2-year experience requirement.⁴⁸ According to FAA officials, the agency is drafting a proposed regulatory change to allow appropriately qualified flight instructors who have met proficiency requirements to train other pilots to obtain a CFI.

The Cost of Flight Training Is a Challenge for Some Colleges in Recruiting and Retaining Students

There was general agreement among the majority of school representatives we interviewed that in the last 5 years more students have shown interest in the pilot profession by applying for and enrolling in pilot programs at collegiate aviation schools. Representatives from eight schools and one aviation industry stakeholder noted that students may be interested in becoming pilots because there appears to be more pilot career opportunities and a greater likelihood of a secure and lucrative career path. Some airlines have created career path programs that document the requirements to move along the career path from pilot school to a particular regional airline and on to a particular mainline airline. According to an association representing pilots, they have done so to encourage more students to enter the pilot profession. Nonetheless, representatives from nearly all schools we interviewed identified the cost of a professional pilot degree program as a great (10 schools) or a moderate (6 schools) challenge to recruiting and retaining students.

⁴⁸ See *Aviation Rulemaking Advisory Committee, ARAC Input to Support Regulatory Reform of Aviation Regulations – ARAC Addendum Report* (Washington, D.C.: Sept. 12, 2017). The FAA Aviation Rulemaking Advisory Committee is a formal standing advisory committee, comprised of representatives from aviation associations, aviation industry, public interest groups, advocacy groups, foreign civil authorities, and FAA. The committee provides FAA with information, advice, and recommendations, concerning rulemaking activity.

While high education costs are not unique to pilot programs, these programs can be particularly expensive, and therefore unaffordable to many students.⁴⁹ As previously reported, professional pilot students incur flight training “lab fees” in addition to general college tuition and fees, that together often exceeds \$100,000.⁵⁰ Schools’ tuition and fees can vary significantly. Factors affecting cost include whether the school is public, private non-profit, or private for-profit, whether the school offers a 2-year or 4-year program, and the student’s resident status. According to Education’s data, annual in-state tuition at public collegiate aviation schools we identified ranges from approximately \$1,100 to \$13,000. However, annual out-of-state tuition at a public 4-year program can cost as much as approximately \$28,800. Private school tuition can cost more. For example, one 4-year private for-profit collegiate aviation school lists estimated annual undergraduate tuition of nearly \$36,000, not including room and board or flight training costs.

Flight training costs also vary considerably. According to the University Aviation Association’s 2016 directory of collegiate aviation schools, a majority of pilot programs (27 of 45) have total approximate flight training costs of more than \$50,000, with an upper cost of about \$81,000.⁵¹ Flight training costs may vary, depending on the school requirements, student interest, and aptitude. Pilot program curriculum may differ and some students may choose to take additional classes.⁵² Each additional certificate and rating adds to the total cost of the training. Also, the time required for students to complete their certificates and ratings varies. Compounding the issue of cost is that the maximum federal financial aid available to eligible students is well below the full cost of a collegiate flight education, a factor that is also not unique to collegiate aviation students. For academic years 2017–2018 and 2018–2019, the maximum federal

⁴⁹ There is widespread concern that the rising costs of higher education are making college unaffordable for many students and their families. See GAO, *Higher Education: State Funding Trends and Policies on Affordability*, [GAO-15-151](#) (Washington, D.C.: Dec. 16, 2014).

⁵⁰ GAO, *Initial Pilot Training: Better Management Controls Are Needed to Improve FAA Oversight*, [GAO-12-117](#) (Washington, D.C.: Nov. 4, 2011).

⁵¹ University Aviation Association, *The Collegiate Aviation Guide, Sixth Edition* (Auburn, AL: 2016).

⁵² As previously discussed, pilot students may obtain a number of ratings and certifications on their path to become an airline pilot. Some professional pilot degree programs require a minimum of a commercial pilot certification, while others require a flight instructor certificate or multi-engine rating.

Pell Grant award is currently \$5,920, and annual federal loan limits range from \$5,500 up to \$12,500 depending on the student's year in school, dependency status, and other factors. Most students need to either use family resources or take out private loans to pay for the total cost of a pilot program, according to representatives from four schools. Not all students have the means to do so, as private lenders may require a co-signer with good credit and a minimum income level.⁵³ Also, representatives from two schools said that some students who initially secure private loans for flight training are unable or unwilling to secure loans needed later on to complete this training, causing them to leave the pilot program. This financing challenge may pose a significant barrier for lower income students to enter the pilot profession.

There are lower cost alternatives to collegiate aviation schools, though they are not entirely equivalent. Students may obtain a flight education and achieve the same FAA certificates and ratings from a non-collegiate pilot school and incur flight training expenses without the added cost of college tuition. As previously discussed, a pilot with non-collegiate flight training could be eligible for the same employment opportunities with regional airlines, but according to five stakeholders, airlines prefer or have typically hired pilots with a 4-year degree. Military service is another lower cost alternative for flight training, as service members are compensated for their time while they are training. However, one school representative noted that service members may enlist in the military with the intention of pursuing flight training, but they are not guaranteed to receive a flight assignment.

Representatives from two stakeholders told us it is not possible to significantly reduce the cost of flight training because it is inherently expensive, and four school representatives said that costs are increasing.⁵⁴ One approach to controlling costs for students is to make it easier for them to transfer from public 2-year pilot programs to 4-year programs, since public 2-year programs are typically less expensive. A representative from a state university told us that he is developing a degree completion program for professional pilot students from U.S. 2-year colleges. This program would enable students to complete their

⁵³ GAO, *Federal Student Loans: Impact of Loan Limit Increases on College Prices Is Difficult to Discern*, [GAO-14-7](#). (Washington, D.C.: Feb. 18, 2014).

⁵⁴ Representatives from some schools and stakeholders told us that in addition to general tuition and fees, key cost drivers for professional pilot degree programs are purchasing and maintaining aircraft, insurance, and fuel.

bachelor's degree online with the university after they have obtained an associate's degree in flight. Similarly, a community college has transfer agreements with several 4-year universities, and most of its students aim to obtain a 4-year college degree. We previously found that when colleges provide their students with information on transfer agreements they help students save on tuition costs by enabling students to predict which credits will transfer and reducing the likelihood that they will need to repeat coursework.⁵⁵ Two schools have opened satellite campuses for their flight programs, and two other schools are considering that option, both to expand their capacity and to provide options for students to receive flight training while living closer to home, according to school representatives.

Other actions schools have taken focus on ensuring that students are able to pay for the program and offering assistance with costs where possible. Representatives of three schools told us that they are raising money for departmental scholarships, and a representative of one school said the school raises awareness about outside scholarships that may be available to its students.⁵⁶ A representative from a community college said that there are scholarships available for women and minorities. According to one industry representative, there are not enough women and minorities in aviation, which will negatively affect the supply of future pilots. One state university offers in-state tuition for flight students who are residents of nearby states, with the aim of both reducing some students' costs and increasing enrollment at the school. Representatives of four schools told us that they emphasize communication with potential students about costs before they enroll to improve pilot student retention. In addition, one school we spoke with requires students to pay their flight training fees for each certification upfront in one lump sum to ensure that students will be able to complete the training.

Initiatives to assist students with funding and reduce costs of flight training have been in place for a long time with limited impact, according to one flight training provider association. Other aviation stakeholders noted that regional and mainline airlines could have a greater effect than

⁵⁵ See GAO, *Higher Education: Students Need More Information to Help Reduce Challenges in Transferring College Credits*, [GAO-17-574](#). (Washington, D.C.: August 14, 2017)

⁵⁶ A variety of organizations offer aviation-based scholarships. However, one representative of flight training providers noted that the scholarships are small compared to the total cost of a professional pilot degree.

previous efforts by working together. For example, airlines could provide scholarships and subsidize students' flight training while students are still in school. The airlines could also work together as an industry to provide scholarships to students. However, as one aviation association noted, airlines are reluctant to provide scholarships to students who are likely to fly for a competitor. Representatives from two stakeholders suggested that increases to limits on federal student loans could provide additional resources to help students pay for flight training costs. To some extent and even if additional actions are taken to help defray some of the educational costs, some students may not be able to afford the cost of collegiate aviation schools.

A Variety of Other Factors May Present Challenges for Some Collegiate Aviation Schools

Some selected school representatives also cited other challenges, though these challenges were cited by fewer representatives, and most of the representatives characterized these challenges as moderate or slight.

- *Purchasing and maintaining aircraft.* Representatives from 13 schools said that purchasing or maintaining aircraft, or obtaining the requisite purchase approvals can be challenging. New single-engine training aircraft could cost more than \$300,000, while a new multi-engine aircraft can cost around \$750,000. Purchasing older, used equipment is one possible way to defray aircraft costs, but older equipment requires more time offline for maintenance.⁵⁷ Representatives from two schools stated that aircraft used for training requires extensive scheduled and unscheduled maintenance, which can interfere with their ability to train students.
- *Airport infrastructure and airspace constraints.* When asked about challenges related to airport infrastructure, representatives of six schools identified challenges related to space constraints. Issues included insufficient space to store and maintain aircraft, insufficient classroom and office space, and crowded airspace that cannot accommodate the desired flight operations to train the number of pilot students they could with their existing resources. Few representatives identified infrastructure availability at the airport as a great (1 school)

⁵⁷ While older aircraft are generally less expensive to purchase, they can be more costly to maintain. One school representative reported spending about \$150,000 per year to maintain the school's 11 older model aircraft.

or moderate (3 schools) challenge, while 6 representatives reported that infrastructure posed only a slight challenge and 7 said it was not a challenge at all.

- *VA education benefit program administration—publication of specific training hours and costs.* Representatives from eight schools and two stakeholders expressed some concern about new enforcement of VA education benefit rules from the Post 9/11 GI Bill, as amended by the Post-9/11 Veterans Educational Assistance Improvements Act of 2010.⁵⁸ VA issued two policy advisories in 2015 to notify collegiate aviation schools about statutory education benefit policies and bring them into compliance. One policy advisory notified schools that they must publish the specific number of training hours, as well as the specific cost of training, for each flight course, effectively setting a maximum number of training hours and fixed fees for each course taken as part of a standard degree program.⁵⁹ According to VA, before the agency issued the policy advisories there was great public and congressional outcry about individual pilot students receiving hundreds of thousands of dollars from VA for their education. VA issued the policy advisories to specify what pilot training activities are appropriate uses of VA money, and under what circumstances. VA funds cannot be used to pay for pilot training to proficiency because that would entail an unlimited amount of funds to be available for an individual's flight training.

Representatives from five selected schools reported that this rule made it difficult to provide efficient and effective flight training for all pilot students. Depending on the program structure, students who cannot finish the course in the set number of hours must either pay out of pocket for additional training or accept a failing grade and take the course again. VA education benefits pay for eligible beneficiaries to repeat the course if needed. In contrast, FAA imposes a minimum but not a maximum number of hours per certificate, because the training goal is to achieve a certain level of proficiency for each certificate. One school representative stated that the school allowed its VA education benefit eligibility to lapse because it allowed them the freedom to train students to proficiency without maximum training hours; however, veterans can no longer use their benefits to enroll in that program.

⁵⁸ Pub. L. No. 111-377, § 102, 124 Stat. 4106, 4108 (2010).

⁵⁹ Veterans Affairs Compliance and Liaison Advisory 223-15-01, September 1, 2015.

- *VA education benefit eligibility for contracted flight instruction.* Representatives of two out of the five schools we interviewed that contract out flight training and one stakeholder reported a challenge concerning a rule described in the second VA policy advisory; the rule places restrictions on collegiate aviation schools that contract out flight training to a non-collegiate school.⁶⁰ Previously, veterans received benefits for flight training conducted at non-collegiate pilot schools through the institution of higher learning that contracted out the flight training.⁶¹ However, in its policy advisory VA stated that this practice was not consistent with the rules of the education benefit program because there are different rules for non-collegiate pilot schools; VA benefits cannot be used to pay for training toward private pilot certification at non-collegiate pilot schools. In addition, federal law states that the VA cannot approve the enrollment of an eligible veteran in a course if it involves contracted training that is either otherwise barred from being approved or has not obtained approval on its own.⁶²

As a result, to remain eligible for VA education benefits, a collegiate aviation school cannot include private pilot certification training provided by a non-collegiate pilot school in its degree program since such training is statutorily barred from approval at the contracted non-collegiate pilot school.⁶³ Therefore, all students enrolled in such programs must have already earned their private pilot certificate before matriculating in the program, whether they use veterans' education benefits or not. According to VA, it issued its policy advisory to clarify the statutory limitations of education benefits under the GI Bill relating to private pilot certificate courses. Representatives from two schools said that they are currently not eligible for VA education benefits as a result of this rule, which representatives of one school said has affected the school's enrollment of veterans. Furthermore, industry stakeholders have expressed concern about greater limits on VA education benefits for flight training based on possible future

⁶⁰ Veterans Affairs Compliance and Liaison Advisory 223-15-02, December 2015.

⁶¹ According to VA, several state approving agencies (SAAs) authorized these degree programs though they were not in compliance with statute. VA contracts with each SAA to approve programs of education and provides training and oversight to the SAAs.

⁶² 38 U.S.C. § 3680A(f).

⁶³ 38 U.S.C. §§ 3034(d)(2), 3313(b).

legislative action.⁶⁴ Meanwhile, the U.S. Department of Transportation has announced a new “Forces to Flyers Initiative” with two objectives: (1) to assess the level of interest among veterans in becoming pilots and (2) to help veterans who are not former military pilots to receive the training they need to become commercial pilots.⁶⁵ Though representatives from five schools identified this issue as a great challenge, overall its impact is limited because not all schools have students using veterans’ benefits for their pilot programs, and a small percentage of students overall use veterans’ benefits to pay for their education.

Agency Comments

We provided a draft of this product to the DOT, Education, and VA for comment. DOT provided technical comments, which we incorporated as appropriate. Education and VA declined to provide formal or technical comments.

We are sending copies of this report to the appropriate congressional committees, the Secretary of the Department of Transportation, the Secretary of the Department of Veterans Affairs, the Secretary of the Department of Education, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at 202-512-2834 or vonaha@gao.gov. Contact points for our Office of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix II.

⁶⁴ Aviation industry representatives expressed concerns about a cap on tuition and fees for flight training degree programs within H.R. 4149 (115th Cong.) in a November 28, 2017, letter to the House Committee on Veterans Affairs.

⁶⁵ For more information about the Forces to Flyers Initiative, see Remarks Prepared for Delivery by U.S. Secretary of Transportation Elaine L. Chao. Washington DC, November 16, 2017.

A handwritten signature in black ink, appearing to read "Andrew Von Ah". The signature is fluid and cursive, with a large initial "A" and a long, sweeping tail.

Andrew Von Ah
Director, Civil Aviation Issues

List of Addressees

The Honorable Susan M. Collins
Chairman
The Honorable Jack Reed
Ranking Member
Subcommittee on Transportation, Housing
and Urban Development, and Related Agencies
Committee on Appropriations
United States Senate

The Honorable Mario Diaz-Balart
Chairman
The Honorable David E. Price
Ranking Member
Subcommittee on Transportation, Housing
and Urban Development, and Related Agencies
Committee on Appropriations
House of Representatives

The Honorable Heidi Heitkamp
Ranking Member
Subcommittee on Regulatory Affairs and Federal Management
Committee on Homeland Security and Governmental Affairs
United States Senate

Appendix I: Objectives, Scope, and Methodology

For our review we addressed (1) what is known about collegiate aviation schools with professional pilot degree programs in terms of location, types of training programs available, and enrollment; and (2) challenges that affect collegiate aviation schools' ability to produce professional pilots and schools' response to these challenges.

To address both objectives, we reviewed a range of reports from GAO, Federal Aviation Administration (FAA), Congressional Research Service, and Bureau of Labor Statistics: these reports included general background information on a variety of related issues on pilot training, issues such as pilot certification and training issues in the United States; FAA regulatory training requirements for different levels of pilot certification; types and requirements of pilot training schools; current supply and demand, and forecasts for commercial airline pilots; and airport infrastructure financing. Furthermore, we reviewed the Federal Aviation Regulations related to training and certification for pilots under Part 61 and Part 141. We also reviewed provisions of the Airline Safety and Federal Aviation Administration Extension Act of 2010 (Pub. L. No. 111-216) related to "Flight Crewmember Screening and Qualifications" and "Airline Transport Pilot Certification."

To determine what is known about collegiate aviation schools we analyzed several sets of data and interviewed representatives from collegiate aviation schools and other aviation stakeholders. To identify colleges and universities with professional pilot degree programs for fixed wing aircraft in academic year 2015–2016,¹ we compared FAA's data on FAA-certificated pilot schools as of August 19, 2016; the Aircraft Owner and Pilot Association's list of colleges and universities with aviation programs as of September 19, 2016; and the University Aviation Association's 2016 directory of collegiate aviation schools.² These data

¹ We did not study aviation programs such as rotorcraft (e.g., helicopters) or other, non-flight aviation majors such as air traffic control or aviation maintenance because they are generally not suited for becoming commercial airline pilots.

² University Aviation Association, *The Collegiate Aviation Guide*.

were the most applicable given the academic year reviewed. We verified schools on all three lists by checking school websites, typically the program's webpage or course catalog detailing degree program requirements. For schools that were included on only one or two of the lists, two staff members independently reviewed school information and categorized the school as inside or outside of our scope. Disagreements between coders were reviewed by a third staff member and resolved through discussion. In a few cases where website information was unclear, the staff member contacted school officials to verify that they offered a professional pilot degree program.³ To determine the airport and airport types at which schools with professional pilot degree programs operated their flight training, we reviewed information from FAA's National Plan of Integrated Airport Systems, the Aircraft Owner and Pilot Association, and school websites.⁴ We also selected and interviewed representatives of six airports of varying types (e.g., medium-hub, small-hub, and non-hub) and in different geographic areas of the country, all of whom had collegiate aviation school tenants. Because we selected the airports as part of a nonprobability sample, our findings cannot be generalized to all airports with collegiate aviation school tenants.

To determine what is known about the institution type, college-wide tuition and fees, and graduations at these schools, we analyzed data from Education's Integrated Postsecondary Education Data System (IPEDS).⁵ Of the 147 collegiate aviation schools with professional pilot degree programs that we identified, 146 of them have an IPEDS identification number. According to Education officials, schools with an IPEDS identification number are likely to participate in Title IV financial aid, be accredited, and consequently be monitored by Education through several mechanisms including IPEDS, federal student aid compliance, and accreditation. With respect the institution type, the categories of schools

³ In some instances, we found schools that operated in the 2015-2016 school year had discontinued their program. However, these schools remained in our analysis. We did not include schools that opened professional pilot degree programs in the 2016-2017 academic year or later.

⁴ FAA, *National Plan of Integrated Airport Systems, 2017-2021*. The National Plan of Integrated Airport Systems is a plan for developing public use airports in the United States.

⁵ The Integrated Postsecondary Education Data System (IPEDS) is the federal government's core postsecondary data collection program. All postsecondary schools participating in federal student financial aid programs are required to complete a group of annual surveys on a variety of topics.

included in our analysis included degree-granting institutions of the following types: public, private non-profit, and private for profit with either 4-year baccalaureate or 2-year associates degrees. With respect to tuition and fees, we reviewed both in-state and out-of-state costs schools reported to Education.⁶ Data were not available for academic year 2014–2015 for two collegiate aviation schools we identified. In a few instances schools offered lower-cost tuition and fees to local students (in-district). For purposes of comparison, we did not include these costs in our report, since not all schools offer in-district discounts. With respect to the graduations data, we analyzed graduations data in academic year 2015–2016 in 10 aviation-related categories within Education’s Classification of Instructional Programs (CIP) for schools we identified as having professional pilot degree programs.⁷ We determined that IPEDS data were sufficiently reliable for the purposes of our reporting objectives based on prior testing of the data from these systems and interviews with knowledgeable officials at Education’s National Center for Education Statistics.

To determine what is known about enrollment at collegiate aviation schools, we analyzed enrollment and flight instructor data voluntarily reported to FAA by some schools between October 2015 and October 2017.⁸ Through interviews with FAA officials, we have determined these data were the most complete sources available and, while limited, were sufficiently reliable for the purpose of illustrating the variety in the size of professional pilot degree program enrollment. We also obtained and analyzed FAA’s pilot certificate and instrument rating data to identify, for a

⁶ Academic year 2014-2015 was the most recent information available for institution type and college-wide tuition and fees.

⁷ The 2015–2016 academic year was the most recent graduation (also referred to as degree completion) information available from the database. According to the Department of Education’s National Center for Education Statistics, the Classification of Instructional Programs (CIP) is a coding scheme of instructional programs. Its purpose is to facilitate the organization, collection, and reporting of fields of study and program completions. The CIP titles and program descriptions are intended to be generic categories into which program completions data can be placed, not exact duplicates of a specific major or field of study titles used by individual institutions. The CIP is the accepted federal government statistical standard on instructional program classifications and is used in a variety of education information surveys and databases.

⁸ Pilot school regulations prescribe the requirements for issuing pilot school certificates and the general operating rules applicable to a holder of the certificate. Collegiate aviation schools operating under Part 141 voluntarily report enrollment and flight instructor employment data. FAA collects the data on an on-going basis, and FAA does not audit the data to verify accuracy.

number of categories, the number of new pilot certificates FAA issued from 2012 through 2016 and the total number of pilot certificate holders for those years.⁹ One limitation associated with the database in which FAA stores certificate-holder information is that the agency does not have an active process in place to discover and deactivate deceased pilots. This lack may lead to an over count in the number of active pilot certificates. However, airline transport pilot certificate holders must regularly renew their medical certificates to remain active. We found that the data were sufficiently reliable for the purposes of reporting the number of “restricted privileges” airline transport pilot certificates FAA has issued since 2013.

To determine challenges that affect collegiate aviation schools’ ability to produce professional pilots, we reviewed documents, interviewed, and administered a standardized question set to a non-generalizable sample of 18 collegiate aviation schools about their pilot programs and key challenges that affect their ability to produce professional pilots. To select our non-generalizable sample of schools, we used information from FAA, the Aircraft Owner and Pilot Association, school websites, and initial interviews with aviation stakeholders. Based on the schools’ geographic location, we selected schools in each of FAA’s nine airport regions. In order to provide a variety of perspectives in our selection, we included schools of each institution type (public, private non-profit, and private for-profit), of each program type (2-year and 4-year), some that were FAA-certificated and some that contracted out flight training. While the sample allowed us to learn about challenges that affect these schools’ ability to produce professional pilots, it was designed to provide anecdotal information, not findings that would be representative of all collegiate aviation schools with professional pilot degree programs in the United States. Our initial selection included 20 schools, of which 19 responded to our request for interview. Of these 19, 18 schools responded to our question set, and representatives of one additional school provided us with general information about their program.

⁹ FAA does not proactively purge deceased certificate holders from its airmen database; however, deceased certificate holders in certain categories will be deactivated if they do not renew their medical license when it expires and all certificate holders are deactivated at age 90.

Table 2: Collegiate Aviation Schools Interviewed

| | |
|---|------------------------------|
| Bridgewater State University | Bridgewater, Massachusetts |
| California Baptist University | Riverside, California |
| Chandler-Gilbert Community College | Chandler, Arizona |
| Community College of Baltimore County | Multiple locations, Maryland |
| Embry-Riddle Aeronautical University, Daytona Beach | Daytona Beach, Florida |
| Glendale Community College ^a | Glendale, California |
| Hampton University | Hampton, Virginia |
| Kansas State Polytechnic | Salina, Kansas |
| Middle Georgia State University | Multiple locations, Georgia |
| Oklahoma State University | Stillwater, Oklahoma |
| Purdue University | West Lafayette, Indiana |
| Quincy University | Quincy, Illinois |
| University of Alaska at Anchorage | Anchorage, Alaska |
| University of North Dakota | Grand Forks, North Dakota |
| University of Oklahoma | Norman, Oklahoma |
| Utah State University | Logan, Utah |
| Wallace State Community College | Hanceville, Alabama |
| Western Michigan University | Kalamazoo, Michigan |
| Westminster College | Salt Lake City, Utah |

Source: GAO. | GAO-18-403

^aGlendale Community College provided us with general information about its program but declined to answer our question set.

In our question set, we asked schools to rate 10 factors that we identified in preliminary interviews as potentially affecting schools’ ability to recruit, retain, and train professional pilot students—thereby affecting their ability to produce pilots. Schools rated each factor as a great challenge, a moderate challenge, a slight challenge, or not a challenge to the ability to recruit, retain, and train professional pilot students. After our interviews with officials from the selected schools, we analyzed and aggregated responses to these questions, and identified two factors that schools most frequently cited as the most challenging to their ability to produce pilots. In addition, 3 other factors were cited by multiple schools as a great or moderate challenge. Schools generally cited the remaining 5 factors as a slight or moderate challenge.

Table 3: Summary of Factors That Selected Collegiate Aviation Schools Reported as Affecting Their Ability to Produce Pilots

| Factors | Great challenge | Moderate challenge | Slight challenge | Not a challenge | No response |
|--|-----------------|--------------------|------------------|-----------------|-------------|
| Recruiting and retaining flight instructors | 11 | 5 | 1 | 1 | 0 |
| The cost of a collegiate flight education for students (including cost of flight training/lab fees, cost of tuition, other fees/expenses) | 10 | 6 | 2 | 0 | 0 |
| The school's ability to purchase and maintain aircraft | 3 | 8 | 3 | 4 | 0 |
| Infrastructure availability at the school's primary airport (e.g., runways, hangar space, control towers) | 1 | 3 | 6 | 7 | 1 |
| Eligibility for veterans' education benefits | 5 | 2 | 3 | 6 | 2 |
| Availability or eligibility for federal financial aid | 3 | 8 | 3 | 2 | 2 |
| Recruiting and retaining faculty | 2 | 6 | 6 | 4 | 0 |
| Starting pay for commercial pilots upon graduation | 0 | 4 | 6 | 8 | 0 |
| Operating under FAA pilot training requirements (Part 61) and/or obtaining and maintaining FAA pilot school certification requirements (Part 141) ^a | 0 | 5 | 0 | 13 | 0 |
| Maintenance of airport infrastructure (e.g., maintaining and repairing runways or aprons, snow removal) | 0 | 2 | 3 | 13 | 0 |

Source: GAO. | GAO-18-403

^a14 C.F.R. Parts 61 and 141.

To describe stakeholders' views of factors that affect collegiate aviation schools' ability to produce pilots and actions that have been or could be taken to address these factors, we reviewed and summarized schools' comments. We also reviewed documents and interviewed FAA officials, representatives of airports and industry organizations representing collegiate and non-collegiate pilot schools, airports, flight instructors, pilots, regional airlines, and mainline airlines, selected to reflect a range of perspectives about initial pilot training. (See table 4.) In addition, we reviewed documents and interviewed Education and Department of Veterans Affairs officials about regulations and policies related to pilot programs' eligibility for federal student financial aid and the use of veterans' education benefits.

Table 4: Aviation Stakeholders Interviewed

| |
|--|
| Non-collegiate aviation school |
| Boeing |
| Industry organizations |
| Air Line Pilots Association |
| Aircraft Owners and Pilots Association |
| Airlines for America |
| Airports Council International-North America |
| Aviation Accreditation Board International |
| Coalition of Airline Pilots Associations |
| Flight School Association of North America |
| National Association of Flight Instructors |
| Regional Airlines Association |
| University Aviation Association |

Source: GAO. | GAO-18-403

Note: Delta Airlines provided written responses in lieu of an interview.

We conducted this performance audit from September 2016 to May 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Andrew Von Ah, (202) 512-2834, or vonaha@gao.gov

Staff Acknowledgments

In addition to the contact named above, Gerald Dillingham, Ph.D. (Director); Vashun Cole (Assistant Director); Jaclyn Mullen (Analyst-in-Charge); Amy Abramowitz; Danielle Ellingston; Dave Hooper; Delwen Jones; Serena Lo; John Mingus; Natasha Oliver; Malika Rice; Michelle St. Pierre; and Elizabeth Wood made key contributions to this report.

Appendix V: Accessible Data

Data Tables

Data Table for Figure 3: Collegiate Aviation Schools with Professional Pilot Degree Programs by Degree Length and School Type, Academic Year 2014–2015

| School Type | 2-year degree program | 4-year degree program |
|-------------------------|------------------------------|------------------------------|
| Private, for-profit | 1% | 2% |
| Private, not-for-profit | 1% | 21% |
| Public | 36% | 40% |

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