

From “Air Conditioning” Youth to STEM: The FAA and Aviation Education, 1935–2007

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The Federal Aviation Administration (FAA) and its predecessor organizations pioneered the use of aviation education in working with the primary and secondary schools and colleges of the nation. This work began in 1935, when the Department of Commerce’s Bureau of Air Commerce began working to define and promote aviation education. With political tensions in Europe increasing, and believing that aviation would play a large role in any future armed conflict, the Bureau believed it critical that Americans understand the need for and power of aviation, as well as its economic and military benefits.

For over 75 years, often with limited or no resources and changing mandates from agency executives, program specialists and agency volunteers have continued to encourage students at all levels to study math, science, technology, engineering, and a host of other disciplines through a variety of innovative programs and partnerships. Although the FAA’s efforts were not always the structured educational activities undertaken in the early years, the agency continued to teach millions of children and young adults about the myriad jobs available in the aerospace industry and the educational experience necessary to obtain and succeed at those jobs. The program has evolved from one dedicated to help train pilots for military service in World War II, to a public affairs program aimed at improving public perception of the agency, to a pilot program to train college students for hard-to-fill aviation jobs, and finally to a program to encourage middle and high school students to study science and math.



Air Bear and children

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Largely through the work of agency volunteers, the aviation education program has survived. As agency budgets decreased, especially for nonoperational activities, FAA managers allowed employees to volunteer their help in local schools and education programs. By sponsoring and participating in aviation career education (ACE) academies, career day visits, science fairs, educator workshops, and hands-on experience at FAA facilities, employees have kept the aviation education program active despite limited resources and changing agency needs.

Early Education Efforts

By the mid-1930s, public fascination with aviation had grown exponentially from its humble beginnings two decades earlier. Pioneering flights, such as Amelia Earhart's solo flight from Hawaii to the U.S. mainland in 1935, enthralled adults and children alike. Popular magazines touted the economic benefits of the airplane and covered technical advancements in aviation. Now, with political and military unrest increasing in Europe and threats of another world war on the horizon, many in the United States wondered if the country would be ready for another large-scale war. In particular, could the United States hold its own in aerial warfare? Concerns over the national ability to train and recruit sufficient aviators led to a push for aviation education programs at all educational levels.

It fell to the Federal Aviation Administration's predecessor organizations to pioneer the use of aviation education to support and encourage children and young adults to consider careers in aviation. This work began in 1935, when the Department of Commerce's Bureau of Air Commerce initiated a project with the National Education Association (NEA) to define and promote aviation education. In November 1936, the Bureau and the NEA published a 15-page article on aviation education in the *Journal of the National Education Association* that suggested aviation-related activities for students and outlined additional sources for educational materials.¹

Fear that America would not be ready for the next war provided great impetus to aviation education efforts. Perhaps Edward Noble, the chairman of the new Civil Aeronautics Authority (CAA) best described these concerns.² In 1938 he warned that "we

¹ Cited in Mervin K. Strickler, Jr., *Federal Aviation Administration Curriculum Guide for Aviation Magnet Schools Programs* (Washington, DC: FAA Aviation Education Division, 1994), 20.

² The Air Commerce Act of 1926 gave the Department of Commerce responsibility for the regulation of civil aviation. The Department's Aeronautics Branch was renamed the Bureau of Air Commerce in 1934. In 1938, the Civil Aeronautics Act replaced the Bureau of Air Commerce with the independent agency, the Civil Aeronautics Authority, and in 1940 it became the Civil Aeronautics Administration.

have neglected our boys and girls.” He pointed out that aviation education in Europe began in kindergarten and that “Germany and Italy spend hundreds of thousands of dollars training young people.” In the United States, however, “the Government sponsors the theater, and various art projects, and outside of the C.C.C. [Civilian Conservation Corps], which gives some small vocational aviation ground training, not one penny of Government money goes to flying instruction outside of the military services.”³



Edward J. Noble, Chairman, Civil Aeronautics Authority, August 22, 1938–April 12, 1939.

Believing aviation education critical to the nation's future, in December 1938 Noble created a Private Flying Division within the CAA to coordinate with and educate private fliers.⁴ The following month, he announced a prototype aviation training program that would be initiated at a dozen colleges. The division oversaw the program, which focused on training pilots for possible military service. On February 16, 1939, Purdue University in West Lafayette, Indiana, became the first school to participate in the program.⁵ The 1939 Civilian Pilot Training Act made the demonstration project permanent and provided an annual appropriation. When President Franklin Roosevelt reorganized the CAA in 1940, responsibility for the Civilian Pilot Training Program (CPTP) went to the new Civil Aeronautics Administration. By the program's peak in 1944, 1,132 educational institutions and 1,460 flight schools participated in the program training 435,165 pilots, with the majority of its graduates entering military service during World War II.

The focus on the CPTP did not hinder activities devoted to educating younger school children about the benefits of aviation. In spring 1940, the CAA sponsored two groups of writers, eight at the University of Alabama and three in Washington, DC, to write a series of aviation textbooks. Six of the books focused on elementary school instruction and four on more advanced students. The Government Printing Office printed and sold the books, which cost \$4.50 for the set. By July 1942, over one million copies had been sold.⁶

³ Edward J. Noble, “Civil Aeronautics Today,” *Air Commerce Bulletin* 10:4 (Oct. 15, 1938): 97, 100.

⁴ “Private Flying Section Assumes Status of Division,” *Air Commerce Bulletin* 10:6 (Dec. 15, 1938): 169; G. Grant Mason, Jr., “The Authority of Private Flying,” *Air Commerce Bulletin* 10:7 (Jan. 15, 1939): 179.

⁵ “Pilot Training Program Gets Underway,” *Air Commerce Bulletin* 10:9 (Mar. 15, 1939): 23.

⁶ Patricia Strickland, *The Putt-Putt Air Force: The Story of The Civilian Pilot Training Program and The War Training Service, 1939–1940* (Washington, DC: Federal Aviation Administration Aviation Education Staff, ca. 1970), 85.

In April 1942, the CAA moved to provide additional educational resources for teachers of students too young to join the war effort. That month, the CAA and the U.S. Office of Education announced a joint program to “air condition” American youth by stimulating aviation education in elementary and high schools. By encouraging schools to teach aviation topics, the two federal offices hoped to provide school-aged children with basic aviation knowledge and increase public interest in aviation. According to Robert Hinckley, Assistant Secretary of Commerce for Air, the program would “assure a flow of youth versed in aviation to meet war needs and to prepare for the tremendous postwar expansion that is in store for civil aviation.”⁷ As Hinckley bluntly stated, “History has faced us with the plain alternative: Fly – or die! The entire nation must become air-conditioned.”⁸

In his 1942 book, *Air-Conditioning Young America*, Hinckley explained that “to be air-conditioned means to be in a state of readiness to do something about aviation and not just feel strongly about it . . . the term, it should be clear, does not imply merely vocational proficiency, in some field of aviation. Rather, it means a saturation of the American people in aviation skills and a general comprehension of the significance of aviation.”⁹ He continued that aviation education should begin in the primary and secondary schools, and explained that “all children, even the youngest, are interested in planes and what makes them go.” Hinckley believed this “lively interest” in aviation “should be channeled into the classroom to enrich the content and sharpen the relevance of the entire curriculum.”¹⁰

To expand public interest in aviation, the CAA, Army, Navy, and Office of Education created the National Committee on Aviation Education to promote aviation education and guide development of courses in navigation, meteorology, civil air regulations, general aircraft maintenance, and related ground subjects. The committee’s main objectives included the following: stimulating a need for aviation education in schools; promoting aviation education programs for the pre-college age group; and facilitating the rapid development of aviation education in the schools. If the committee was successful, its work would prepare students for the

⁷ “CAA in All-Out Education and Training Drive,” *Civil Aeronautics Journal*, 3:8 (Apr. 15, 1942): 101, 111–12.

⁸ “Education: High Schools Air Conditioned,” *Time*, Oct. 12, 1942, <http://www.time.com/time/magazine/article/0,9171,851531,00.html#ixzz0jktJKESP> (accessed Mar. 31, 2010).

⁹ Robert H. Hinckley and John W. Studebaker, *Air Conditioning Young America* (Washington, DC: CAA and U.S. Office of Education, May 1942), 5.

¹⁰ *Ibid.*, 8.

postwar period in which the airplane would bring about great changes in U.S. economic and social life.¹¹

In July 1942, the CAA announced arrangements to open aviation ground school classes to high school teachers who planned to participate as instructors in the national air conditioning program. More than 650 colleges and universities participated. The CAA reimbursed the colleges for each teacher who completed the required number of classroom hours and took the prescribed examination.¹²

Public school aviation courses began in the fall term of 1942, and, according to CAA Administrator Charles Stanton, approximately 14,000 high schools instituted preflight aeronautics training that year. Students in those programs received a CAA certificate of aeronautical knowledge after completing the required courses and passing an examination. This document signified that a student had completed all ground subject requirements for the private pilot license. By May 15, 1943, the "air conditioning" program, now called the CAA Preflight Aeronautics Program, had paid for the training of 3,500 teachers, and by June 15, 1943, 250,000 students between the ages of 16 and 18 were nearing the completion of preflight training.¹³ Edgar Fuller, Ph.D., chief of the CAA Aviation Education Service, explained the popularity of the program, saying, "Forward-looking educators are aware that we are entering an air age in which every student will need to know the basic principles of aeronautics and their broad social implications. Such an understanding will be necessary whether or not the student ever becomes a civil or military flier."¹⁴

To provide classroom materials for elementary and secondary schools, a team of researchers and writers from Columbia University and the University of Nebraska, in cooperation with the CAA and sponsored by the Institute of Aeronautical Sciences, produced a series of booklets for the Air-Age Education Series.¹⁵ The researchers

¹¹ Ibid., 27.

¹² "Air Conditioning Instructors to Get Training in Ground Schools," *Civil Aeronautics Journal* 3:11 (July 15, 1942): 141; "Schools to Start Preflight Courses in Fall Term," *Civil Aeronautics Journal* 3:13 (Sept. 15, 1942): 165.

¹³ "CAA Reopens Trainee Programs in Seven Regions," *Civil Aeronautics Journal* 3:16 (Dec. 15, 1942): 202; "3,500 H.S. Teachers Trained in CAA Preflight Program," *Civil Aeronautics Journal* 4:5 (May 15, 1943): 59.

¹⁴ "High School Pupils Get Flight Training; 600 in Wisconsin," *CAA Journal* 6:3 (Mar. 15, 1945): 25, 36.

¹⁵ The Institute of Aeronautical Sciences (IAS) was established in 1932 as a society of aeronautics-related professionals after the model of the British Royal Aeronautical Society. The stated purpose of the IAS was to advance the art and science of aeronautics and to publish works of literature, science, and art for such purpose. IAS merged with the American Rocket Society in 1963 to form the American Institute of Aeronautics and Astronautics.

and writers, known as the Aviation Education Group, produced 20 manuscripts published by the MacMillan Company in 1942 and 1943.¹⁶ *Time* magazine said the books “add an aeronautical third dimension to mathematics, physics, biology, history, geography, economics, politics, even literature.” To accomplish this, for example, biology lessons described what happened when a pilot blacked out. Social science lessons pictured a postwar world of “aerial freight trains” delivering people and goods around the country and world. Teachers used biographies and literature about flying to enliven history and English lessons.¹⁷

During the summer of 1943, the CAA held a number of clinics around the country to assess the preflight program. CAA education manager Bruce Uthus reported that “more high school youth wish to enroll than the present restricted facilities of schools can accommodate.” He explained that the increasing interest in aviation education “illustrates that young people are not averse to working strenuously in a course which is functional, interesting, practical, and realistic . . . [I]n addition to its specific contribution to military and civil aviation, preflight aeronautics is proving itself an excellent education vehicle. Mathematics and physics are being absorbed with avidity.”¹⁸ Edgar Fuller reiterated the importance of these courses. Pointing out that “the air age is here,” he argued that schools needed to recognize the implications of human flight in daily living and adapt courses and teaching procedures in the sciences, social studies, and other fields to include aviation topics.¹⁹

For its education efforts, the CAA received the first National Aeronautics Association Brewer Trophy, now awarded annually to an individual, a group, or organization for significant contributions of enduring value to aerospace education in the United States. Vice President Henry A. Wallace presented the award to the CAA for “making it possible for 250,000 youths, 15 to 18 years of age, to exploit their interest in aviation, by availing themselves of aviation education on a nation wide basis in high schools.” In 1944, the CAA’s Dr. Fuller received the Brewer Trophy for his work organizing aviation education curricula in elementary and secondary schools, as well as colleges.²⁰

¹⁶ Strickler, *Magnet Schools Programs*, 22–23.

¹⁷ *Time*, Oct. 12, 1942.

¹⁸ “CAA Confers with Teachers, Students As First Preflight School Years Ends,” *Civil Aeronautics Journal* 4:6 (June 15, 1943): 74; “High School Students Get Second Chance in CAA Private Pilot Exams,” *Civil Aeronautics Journal* 4:9 (Sept. 15, 1943): 122.

¹⁹ *NASSP Bulletin* 28:126 (1944), 7, http://bul.sagepub.com/cgi/pdf_extract/28/126/7 (accessed Apr. 6, 2010).

²⁰ National Aeronautics Association, “Brewer Trophy,” <http://www.naa.aero/html/awards/index.cfm?cmsid=146> (accessed Mar. 31, 2010).

To prepare students for the postwar air age, H. W. Sinclair, CAA assistant administrator for Aviation Training, announced that the CAA would hold at least 27 aviation education workshops for teachers during the summer of 1946 to help school systems adjust their aeronautical studies programs for peacetime.²¹ As part of its postwar efforts, the CAA contracted with the Stanford University School of Education to produce the almost 900-page *Aviation Education Source Book*, edited by Paul Hanna. As opposed to the earlier Air Education Series textbooks that highlighted how topics such as mathematics, history, and science related to aviation, this book provided curricula information and suggested ways to include aviation topics in areas such as social studies, science, language arts, mathematics, art, and music.²² The agency also produced a number of educational brochures and pamphlets, which focused on topics such as aviation careers.²³

Aviation education workshops for teachers quickly became one of the most popular CAA programs. Working through state education departments, teacher-training schools, and other local groups, the agency provided aviation tutorials to thousands of elementary and secondary school teachers.²⁴ In October 1947, the CAA announced that schools in 48 states and the territories of Alaska and Hawaii now offered aviation education classes sponsored and encouraged by its Aviation Education Division.²⁵

In June 1948, the CAA and the American Council on Education sponsored a four-day "Demonstration School Project Conference." Fifty educators from around the country attended to share insights and gather new CAA-produced educational materials. At the conference, the CAA asked the teachers to conduct "practical

²¹ In an early 1945 reorganization, CAA moved the Aviation Education Service under the Manpower and Training Officer. Subsequently renamed the Office of the Assistant Administrator for Aviation Training, the office continued to support a number of aviation education programs. "Reorganization of the CAA Announced by Wright," *CAA Journal* 6:6 (June 15, 1945): 65.

²² Frank G. Mitchell, *25 Years of Progress: A Bibliography of Research Materials and References in the Field of Aviation/Aerospace Education, 1963–1988* (Washington, DC: Federal Aviation Administration, Mar. 1990), 21.

²³ The free publications covered a number of topics, such as: *The Science of Aeronautics in Secondary Schools* (1943); *Aviation for Teachers, a Study Guide for Elementary and Secondary School Teachers* (1945); *Orientation in Air Age Education for Teachers* (1946); and *Outline of a Junior College Program in General and Vocational Aviation* (1947).

²⁴ Mitchell, 22.

²⁵ "27 Aviation Education Workshops Will Give Courses for Teachers," *CAA Journal* 7:7 (July 15, 1946): 87; "Schools in 48 States, Alaska and Hawaii Offer Air Courses," *CAA Journal* 8:10 (Oct. 15, 1947): 115.

studies of aviation education teaching methods” during the upcoming school year to help develop new instruction manuals for the postwar era.²⁶

Interest in aviation education remained high in the early postwar period. In 1946 and 1948, the CAA and the American Council on Education conducted surveys of collegiate courses in aviation and related fields. In 1946, 372 colleges reported programs, and in 1948, 331 colleges reported on their programs.²⁷

Harold E. Mehrens, Ph.D., served as the CAA’s supervisor of the aviation education program in the late 1940s and early 1950s.²⁸ In 1951, in another joint CAA and American Council on Education effort, Mehrens published *Adventures in Aviation Education* to help teachers develop aviation education programs.²⁹ The following year, the CAA published a one-year vocational course for high school students called “Exploring Aviation.” With the Cold War underway and global tensions on the rise, the CAA urged schools to again include a pre-flight aviation course in high schools as they had during World War II. As Administrator Charles Horne pointed out, “We directed students to the important job of flying in 1942. Now we believe the schools can serve the country’s needs by urging a technical aviation career on the boys and girls now in High School.”³⁰

Despite Horne’s encouragement, the CAA’s education activities slowed and eventually stopped. The agency moved the aviation education staff to the Office of Program Coordination³¹ and reduced program resources, which severely limited the production of educational materials and sponsorship of teacher workshops.³² By

²⁶ “Aviation Education Conference Attracts 50 Educators,” *CAA Journal* 9:7 (July 15, 1948), 73.

²⁷ Strickler, *Magnet Schools Programs*, 23.

²⁸ On June 2, 1949, CAA Administrator D. W. Rentzel announced completion of a reorganization begun in October of the preceding year. As part of the reorganization, CAA created a new Office of Aviation Development. Aviation education, air marking, personal flying promotion, and flight information fell under the new office. “CAA Structure is Reorganized; Key Jobs Filled,” *CAA Journal* 9:11 (Nov. 15, 1948): 121, 132; Edmund Preston, *FAA Historical Chronology, Civil Aviation and the Federal Government, 1926–1996* (Washington, DC: Federal Aviation Administration, 1998), 43.

²⁹ H. E. Mehrens, ed., *Adventures in Aviation Education; a Research Report for the Use of Teachers and School Administrators* (Washington, DC: Committee on Aviation Education of the American Council on Education, 1951). As a result of this and his ongoing aviation education work, Mehrens received the 1951 Brewer Trophy. National Aeronautics Association, “Brewer Trophy,” <http://www.naa.aero/html/awards/index.cfm?cmsid=146> (accessed Mar. 31, 2010).

³⁰ “Aviation Courses in High Schools Urged by CAA,” *CAA Journal* 13:7 (July 20, 1952): 65–66.

³¹ U.S. Department of Commerce Telephone Directory, March 1953 and January 1954, FAA History Archives.

³² Strickler, *Magnet Schools Programs*, 23.

the mid-1950s, the CAA had terminated all formal aviation education activities, although individual employees continued to volunteer in their local communities to provide aviation information to local schools.

The Space Race and an Education Revolution

The Soviet Union’s launch of the first man-made satellite, *Sputnik I*, on October 4, 1957, reinvigorated federal education training efforts. Fearing the United States lagged behind the Soviets, government officials and educators pushed for educational reform and improvement in science and mathematics curricula. In July 1958, Congress passed the National Aeronautics and Space Act, which created the National Aeronautics and Space Administration (NASA). The Federal Aviation Act of 1958 created the Federal Aviation Agency (FAA), which replaced the CAA.

Elwood R. Quesada became the first FAA Administrator, and the new agency began operations on December 31, 1958. Quesada’s first priority was to establish an organizational structure for the new agency, and on January 15, 1959, he issued Organizational Order Number 1. Although he did not include an aviation education office, Quesada understood the benefits of and the need for an aviation education program. In early 1959, he wrote his report “The Place of Information in the FAA,” in which he addressed the need for educational outreach, but with a different focus than in the past. He noted the sizable number of companies, trade associations, and other organizations that were involved in aviation educational activities, with much of the material being “misdirected” and “too narrowly informational and proprietary in character.” He stated that the FAA “would do better by establishing itself as a focal center or clearing house for the voluntary activities of other organizations already engaged in aviation education.”³³

With the space race underway, the federal government began to make resources available for aerospace education. In 1960, Administrator Quesada re-established an aviation education program and gave responsibility for it to the Office of Public Affairs.³⁴ Mervin K. Strickler, Jr., Ph.D., joined the FAA as its aviation education manager. Strickler worked tirelessly to develop aviation education partnerships and programs

³³ Elwood Quesada, “The Place of Information in the FAA,” (ca. 1959), FAA History Archives, Folder III 18B.

³⁴ “Federal Aviation Agency Organization Chart,” *FAA Fly-By* 2:9 (Sept. 1960): 8. The second FAA Administrator, Najeeb Halaby, moved responsibility for aviation education to the Office of Assistant Administrator for General Aviation on August 31, 1962. It remained part of the general aviation organization until September 10, 1978, when FAA abolished that office and transferred the aviation education program to the Office of Aviation Policy. Preston, 79, 172.

until his retirement in 1979.³⁵ Under his guidance, the FAA again began publishing aviation education guides for teachers and students.³⁶ In 1968, Strickler edited the seminal *An Introduction to Aerospace Education*, which remained the standard reference guide for teachers and administrators for many years.³⁷ The agency also published and/or sponsored a number of educational brochures for classroom use, such as *Aerospace Units for Elementary Science Classes* (1967), *A Curriculum Guide for Aerospace Sciences* (1967), *Learning Through Aviation* (1969), and *Teacher's Guide for SST-T-T* (1969).

Strickler also partnered with other government agencies and the aviation industry to promote aviation education and careers. The FAA became an early participant and later a sponsor of the annual National Congress on Aviation and Space Education, which began in 1968. The association brought together educators from around the nation to teach them how the wonders of aviation and space could be a useful way to “teach ordinary subjects in an extraordinary way.”³⁸ The organization worked to show educators how they could integrate aviation topics, through hands-on activities, into the normal curricula as a means to inspire and challenge students to excel in all subject areas.

In addition to Strickler's work, in 1968, the FAA's Personnel and Training Office began an experimental program to address long-range agency hiring needs. Pointing out that “our overall agency-wide manpower position would be improved if we were to hire a larger portion of our work force from among applicants with a broader education base,” Assistant Administrator Joseph Tippets proposed working with junior colleges to add aviation-related studies to their curricula. Deputy Administrator David Thomas approved the program on July 19,³⁹ and in September 1969, the FAA released a curriculum package for the experimental aviation

³⁵ He earned the 1966 Brewer Trophy for “his continuous and enthusiastic contributions to the education of youth as to the place of aviation in their lives today and its promises and challenges for tomorrow.” National Aeronautics Association, “Brewer Trophy,” <http://www.naa.aero/html/awards/index.cfm?cmsid=146> (accessed Mar. 31, 2010).

³⁶ In 1967, the Federal Aviation Agency became the Federal Aviation Administration, an organization within the new Department of Transportation.

³⁷ Mervin K. Strickler, Jr., ed. *An Introduction to Aerospace Education*, in cooperation with the editors of *Above and Beyond*, the Encyclopedia of Aviation and Space Sciences (Chicago: New Horizons Publishers, 1968).

³⁸ CAP Regulation 280-2, National Headquarters Civil Air Patrol (Apr. 23, 2009): 3, http://members.gocivilairpatrol.com/media/cms/R280_002_E69E082DA08AA.pdf (accessed Apr. 6, 2010); “National Conference on Aviation and Space Education (NCASE),” CAP Knowledge Base, http://capnhq.custhelp.com/cgi-bin/capnhq.cfg/php/enduser/std_adp.php?p_faqid=114&p_created=1008707271 (accessed Apr. 6, 2010).

³⁹ Strengthening Agency Long Range Position Through College Aviation Technology Programs, Memo from Assistant Administrator for Personnel and Training to FAA Deputy Administrator, July 13, 1968, FAA History Archives, Folder III 11i.

technology education project.⁴⁰ The program consisted of “very loose, and for the most part, oral understandings and arrangements” with 20 colleges. The common factor among the 20 participating schools was that students participated in academic study and FAA-paid work-study programs.⁴¹ By the end of 1970, 604 students had enrolled in the program.⁴² After a thorough review of the experimental program, FAA Administrator John Shaffer approved continuing the program and extending it to four-year colleges.⁴³

With limited resources to conduct any large-scale aviation education activities, in the early 1970s Strickler relied largely on FAA volunteers and partnerships with private groups to keep the program alive. Strickler’s strong advocacy of aviation education ultimately helped gain legislative authority for the FAA’s educational activities. On May 31, 1976, President Gerald Ford signed Public Law 94-353, the Airport and Airway Development Act Amendments, which, among other items, mandated FAA’s educational outreach program. The law required the FAA to establish civil aviation information distribution programs within each of its regions to provide informational materials and expertise on various aspects of civil aviation.⁴⁴ The legislative history of the law explained that “every effort must be made to acquaint young people with the full potential of finding careers in air transportation systems and general aviation as well as broadening their perspective of how aviation . . . can bring about more balanced population patterns and an improved quality of life.” Hence, the “FAA should vigorously pursue this program in conjunction with established aviation and aerospace programs of a similar nature being conducted under non-governmental auspices.”⁴⁵

Despite the legislative mandate, limited resources continued to restrict the agency’s education program until J. Lynn Helms became FAA’s Administrator in 1981. With a keen interest in furthering the education of employees, working with colleges and universities to establish aviation curricula, and establishing aviation programs for kindergarten through high school, Helms strengthened and institutionalized aviation education as part of the FAA’s mission. Although his initiatives

⁴⁰ The Experimental Aviation Technology Education Project Curriculum Package, Sept. 1969, FAA History Archives, Folder III 11i.

⁴¹ Ibid., Tab III, program description.

⁴² Ibid., Tab IV, Statistical Summary.

⁴³ Ibid., Memo Associate Administrator for Manpower to the Administrator, July 2, 1970.

⁴⁴ United States Code, *Congressional and Administrative News*, 94th Cong., 2nd sess., 1976, Volume 1, Laws (Eagan, MN: West Publishing Company, 1976), 1654.

⁴⁵ United States Code, *Congressional and Administrative News*, 94th Cong., 2nd sess., 1976, Volume 3, Legislative History (Eagan, MN: West Publishing Company, 1976), 1621.

were delayed by the 1981 air traffic controller strike, by 1983 the aviation education program had gained renewed energy and support.⁴⁶

In early February 1983, Helms proposed formalizing the college education program begun in 1968 as a five-year demonstration project called the Airway Science Curriculum.⁴⁷ The program involved establishing specialized aviation curriculum in colleges and universities and providing a method to hire 500 graduates of the program annually.⁴⁸ With Office of Personnel Management (OPM) and congressional approval, the FAA initiated the program in fiscal year 1982 with the goal of using FAA-developed curriculum as an alternative to the traditional testing process conducted by OPM for four primary occupations: air traffic controller, aviation safety inspector, electronics technician, and computer specialist.⁴⁹

The FAA extended the program in 1988 for the purpose of validating results, since the four-year degree programs were just beginning to produce graduates.⁵⁰ The FAA and OPM, however, terminated the program in 1991 when it became clear that the FAA would not be able to hire enough candidates and obtain meaningful data to verify the results. Between the program's inception and fiscal year 1993, the FAA provided over \$104 million to colleges and universities for airway science buildings and equipment. Of this total, Congress earmarked nearly \$100 million for specific institutions, and the FAA provided the remaining \$4 million through a competitive application process.⁵¹

In addition to the airway science program, the FAA reinvigorated its aviation education program for students at all levels. In early 1983, former U.S. Representative Don Clausen (R-CA) joined the FAA as director of special programs at the request of President Ronald Reagan, a position he held until 1990. Reporting directly to the Administrator, Clausen became responsible for carrying out educational programs.⁵²

⁴⁶ Oral History, Theresa L. Kraus with J. Lynn Helms, May 6, 2010.

⁴⁷ "FAA College/University Program Gets Tentative Approval," *FAA Intercom*, Feb. 28, 1983, news clip in FAA History Archives, Folder III 11i.

⁴⁸ "Airway Science Curriculum," Memo, Director of Personnel and Training to All Heads of Office and Services and Regional and Center Directors, Mar. 30, 1982, FAA History Archives, Folder III 11i.

⁴⁹ "Demonstration Project: Airway Science Curriculum, *Federal Register* 48:137 (July 15, 1983): 32490.

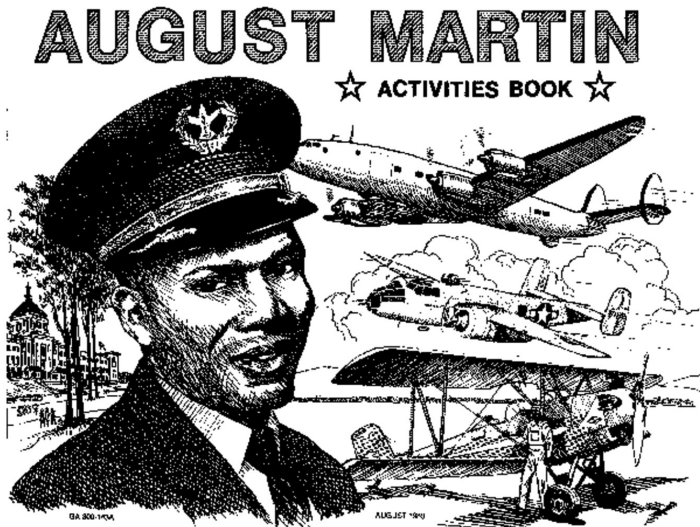
⁵⁰ "Demonstration Project: Airway Science Curriculum, *Federal Register* 53:89 (May 9, 1988): 16484–16485.

⁵¹ Commission on Behavioral and Social Sciences and Education, National Research Council, *Taking Flight: Education and Training for Aviation Careers* (Washington, DC, National Academies Press, 1997): 108, http://www.nap.edu/openbook.php?record_id=5433&page=108 (accessed Apr. 2, 2010).

⁵² Don H. Clausen received the National Aeronautics Association's Brewer Trophy and the National Congress on Aviation and Space Education's Crown Circle Award for his education efforts.

Helms, working with Clausen, issued the agency’s first policy statement on aviation education on April 25, 1983. That policy stated, “to assure a technically qualified workforce able to meet the challenges of changing technology, it shall be the policy of FAA to support education at all levels within the limits of our capability to do so.” Helms encouraged all FAA employees to assume a more active role in their communities and schools in promoting an increased understanding of aviation, airports, and air transportation and their economic, social, and career value in communities and society as a whole.⁵³

Helms also issued an aviation education plan in July 1983 that defined the agency’s program. The purpose of aviation education, he pointed out was to “to develop attitudes and skills, communicate knowledge, and impart understanding relative to the social, economic, political and technical aspects of aviation.” To be successful, any aviation education program had to encompass all educational levels from elementary to post-secondary studies and had to cross all disciplines. Furthermore, it had to motivate pupils to investigate and understand the physical world, and help them define career goals in aviation.⁵⁴



The FAA supplied elementary schools with activity books such as the *August Martin Activities Book* (1980).

⁵³ Policy Statement on Aviation Education, FAA Order 1200.24, appendix 3, FAA History Archives, Washington, DC.

⁵⁴ Mervin K. Strickler, “Guidelines for Federal Aviation Administration Regional Aviation Education Coordinators and Aviation Education Facilitators,” (Washington, DC: Office of Public Affairs, Aviation Education Staff, Aug. 1983): 3.

As part of the plan, the FAA again began supplying elementary schools with activity books such as *August Martin Activities Book* (1980) and *Aviation Science Activities for Elementary Grades* (1983). Between 1984 and 1989, the agency also published a series of career guides, such as *Pilots and Flight Engineers*, *Airport Careers*, *Aircraft Manufacturing Occupations*, and *Airline Careers*.

Donald Engen, Helms's successor as Administrator, continued to emphasize the importance of aviation education. He oversaw the appointment of regional education coordinators. Although many of these coordinators also had responsibilities as public affairs officers,⁵⁵ they recruited and trained aviation education counselors, or facilitators, who helped promote aviation education and fostered a wider knowledge and deeper understanding of the FAA, the national airspace system, and all facets of aviation.⁵⁶ The FAA contracted with Mervin Strickler to develop a program plan. In "Guidelines for Federal Aviation Administration Regional Aviation Education Coordinators and Aviation Education Facilitators," Strickler identified three key goals for the program: use tested aviation education techniques in working with students and educators; involve FAA employees as resources; and ensure the FAA makes the fullest possible use of existing aviation education resources both within and outside the agency.⁵⁷

During Engen's tenure (April 10, 1984–July 2, 1987), the FAA's education specialists initiated the Partnership-in-Education concept as a means of increasing science, mathematics, and technology literacy. They also spearheaded the Department of Transportation's Adopt-a-School Program when the FAA adopted its first school, Hine Junior High School in Washington, DC. Touting the accomplishments of the program, Engen pointed out, "As a result of the information and technology revolution underway, there is now an education revolution to meet the challenge . . . [and the FAA] is on the leading edge of that revolution with its Aviation Education Program."⁵⁸

Following his predecessor's lead, Administrator T. Allan McArtor (July 22, 1987–February 17, 1989) maintained a focus on education, but saw the aviation education program as a tool to foster a better public image for the FAA. Believing the public was losing faith

⁵⁵ Helms moved aviation education responsibilities from the Office of Aviation Policy back to the Office of Public Affairs in 1983, although the move was not formalized until FAA issued Agency Order 1200.8B on February 4, 1984. Preston, 198.

⁵⁶ Strickler, *Magnet Schools Programs*, Section XVI, 1.

⁵⁷ Strickler, "Guidelines," 3.

⁵⁸ John D. Hanks, "Motivating America's Youth: FAA's Aviation Education Program Seeks New Technical Literacy," *FAA World* 14:8 (Aug. 1984): 4–6.

in the safety and integrity of the aviation system, McArtor designed his “Impact 88” program as a means of taking “bold and decisive action” to restore that confidence. A key element in the initiative centered on a public affairs and aviation education strategy that would shape positive aviation awareness among the public and media. McArtor wanted to take his “campaign to the people—to the schools, talk shows, civic centers—and explain why American aviation is critical to this country’s global competitiveness.”⁵⁹

With Impact 88 advocating strong public awareness of aviation, perhaps the FAA’s aviation education program reached its pinnacle during McArtor’s tenure as Administrator, at least in terms of resources. At the national level, the aviation education staff consisted of one program manager and four staff members. Each of the nine FAA regions and the two centers had one full-time staff member dedicated to aviation education and public outreach, and the program was fairly well-funded.⁶⁰

To ensure wide distribution of its aviation education materials, in January 1989, the FAA established its first of many aviation education resource centers. Located at and run by universities and aviation trade groups, these centers provided FAA-printed materials, videotapes, and educational software. Resource center personnel answered informational requests, conducted workshops, and made aviation-related presentations to the public.⁶¹ The agency’s 50th resource center opened in 1991 at the State Transportation Library in Boston.⁶²

In 1989, the FAA adopted Air Bear as its official aviation education mascot. Air Bear, the idea of Janice Draper of the Illinois Division of Aeronautics, had won the National Association of State Aviation Officials award for most innovative state program in 1988. Air Bear’s mission was to promote aviation awareness among pre-school and kindergarten children.⁶³

By the late 1980s, agency financial support of the program significantly decreased. With a national mandate to decrease federal spending, and with the Cold War

⁵⁹ “Impact 88 Under Way,” *FAA Northwest Mountain Region Designee Newsletter* (June 1, 1988), http://www.faa.gov/aircraft/air_cert/design_approvals/transport/Cert_Update/Edition01-10/media/Edition07.pdf (accessed Apr. 5, 2010).

⁶⁰ Shelia Bauer, “Aviation and Space Education Program Status and Needs,” Mar. 2, 2005, FAA History Files, Folder III 11i.

⁶¹ “Eight FAA Aviation Education Resource Centers,” *Aviation Education Newsletter*, National Aeronautic Association 1:1 (Jan. 1989): 1.

⁶² “11 for New England, 50 for Nation,” *FAA World* 21:10 (Dec. 1991): 11.

⁶³ “FAA Adopts Air Bear,” FAA Headquarters *Intercom* (Mar. 14, 1989); “On the Road with Air Bear,” FAA Headquarters *Intercom* (Jan. 9, 1990), FAA History Archives, Folder III 11i.

thawing, the FAA found it increasingly difficult to provide resources to support an education program. Despite recognition of the importance of educational activities, funding agency priorities, such as modernizing the air traffic control system and investing in research and development activities to improve safety, resulted in reduced resources for lower-priority initiatives.

Reliance on Partnerships and Volunteerism

Upon becoming FAA Administrator in June 1989, James Busey strongly encouraged FAA employees to become more involved in aviation education activities, and he endorsed an expansion of educational activities through the use of partnerships as a means of leveraging increasingly scarce program resources. In August 1989, the FAA co-sponsored, with the Civil Air Patrol (CAP) and the Reserve Officers Association, the first Youth Aviation Career Academy, later known as Aviation Career Education (ACE) academies. The first program, designed for students at least 15 years old, lasted two weeks. Sixty-four students attended the course, which provided instruction in ground school requirements, aviation communications and electronics, and an introduction to air traffic control.⁶⁴ The program proved so popular that the FAA announced it would expand the program to 10 locations the following summer.⁶⁵

To ensure content and consistency among all ACE academies, the FAA's regional coordinators prepared lessons learned and recommendations on how to improve future academies. Their work resulted in a standardized list of ACE guidelines.⁶⁶ In its third year of operations, the FAA held ACE academies in each of its nine regions.⁶⁷ During the summer of 1991, the agency held 17 ACE academies for 446

⁶⁴ "Aviation Summer Camp Set August 6," FAA Headquarters *Intercom* (Jul. 18, 1989): "High Flying Camp," FAA Headquarters *Intercom* (Oct. 10, 1989), FAA History Archives, Folder III 11i.

⁶⁵ "Youth Academy Expands," FAA Headquarters *Intercom* (Oct. 30, 1990); "Aviation Youth Academy Expands," Eastern Region *Intercom* (Nov. 15, 1990), FAA History Archives, Folder III 11i.

⁶⁶ Shelia Bauer, former FAA aviation education program manager, telephone conversation with Theresa L. Kraus, July 6, 2010.

⁶⁷ FAA's regional offices included the New England Region, which encompasses Vermont, Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut; the Eastern Region, which encompasses New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, Washington, DC, and West Virginia; the Southern Region, which encompasses Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Florida; the Southwest Region, which encompasses New Mexico, Texas, Oklahoma, Arkansas, and Louisiana; the Central Region, which includes Nebraska, Iowa, Kansas, and Missouri; the Great Lakes Region, which includes North Dakota, South Dakota, Minnesota, Wisconsin, Michigan, Illinois, Indiana, and Ohio; the Western-Pacific Region, which encompasses California, Nevada, Arizona, and Hawaii; the Northwest Mountain Region, which includes Oregon, Washington, Idaho, Montana, Wyoming, Utah, and Colorado; and the Alaskan Region, which includes Alaska. In addition, FAA's William J. Hughes Technical Center is in New Jersey and the Mike Monroney Aeronautical Center is located in Oklahoma.

children. The FAA held two types of academies. ACE I was a one-week program conducted in cooperation with colleges and universities to provide young people opportunities to explore various aviation career options. ACE II programs, more academically rigorous, prepared students for the initial steps toward certification as an air traffic controller, pilot, or communications/electronics technician. The two-week program ended with a series of examinations.⁶⁸

Wanting a more centrally coordinated education program, in December 1989, Busey asked the FAA Executive Board for advice on how to create a “national aviation education program that will inspire the Nation’s youth to choose careers in aviation.”⁶⁹ He also established a task force to assess the FAA’s educational activities and develop a blueprint of how the agency could accomplish its educational objectives. The task force, comprised of 15 employees and one university professor, met with all segments of the aviation community, the governors of each state, and educational institutions, associations, and agencies. In their final report, issued November 27, 1990, task force members outlined five focus areas: 1) activities directed toward increasing public understanding of the FAA and aviation industry; 2) programs addressing aviation safety; 3) marketing to increase awareness of job opportunities in aviation; 4) education initiatives broadening the public’s knowledge of the FAA’s mission; and 5) vigorous EEO/Affirmative action programs.⁷⁰

Task force members noted that the FAA did a satisfactory job in communicating directly with the general public, but that it needed to “increase its influence and profile at the institutional level with the educational community, state and local governments, and industry.” To establish a more effective program, they identified “a significant need for increased management of an expanded, national aviation education program, including increased coordination of national efforts, establishment of an FAA information system, uniform regional implementation of all aviation education programs, increased accountability for expenditures of aviation education resources, and a systematic evaluation process for regional programs.”⁷¹ Other recommendations included establishing an aviation education

⁶⁸ “ACEs for Aviation Education,” *FAA World* 21:9 (Nov. 1991): 1, 10–11.

⁶⁹ Aviation Education, Memo, Acting Chair, Executive Board to Associate Administrator for Human Resource Management and Assistant Administrator for Public Affairs, Dec. 12, 1989, FAA History Archives, Folder III 11i.

⁷⁰ “Aviation Education Final Task Force Report” (Nov. 27, 1990): 7, FAA History Archives, Folder III 11i.

⁷¹ *Ibid.*, 9, 15–16, 18.

council; developing a comprehensive aviation education plan; creating a quarterly reporting system; establishing a line item for aviation education in the FAA budget; and hosting an annual aviation education conference.

The task force report contained over 50 initiatives to “change the course of aviation education in America.” To pay for the program, task force members suggested the FAA fund approximately \$13.6 million in aviation education enhancements/initiatives in Fiscal Year (FY) 1991 and \$25.2 million for activities in FY 1992. As they explained, “The funding will help establish FAA as the national leader by expanding traditional aviation education programs . . . to at least one in every region; [and] greatly intensify FAA’s level of interaction with Congress, state and local government, industry, and the education community.”⁷²

In an April 1991 speech, Busey reaffirmed the need for aviation education programs. He pointed out that few students “will seriously consider aviation careers—unless we stimulate their interest. And few of them will get the education in math and science they need for aviation careers—unless we give it to them.” He noted that the FAA was doing what it could, “but not nearly as much as we’d like, because we’re operating on a shoestring.” He said that he had received a number of good recommendations from the task force, but that many of them would require congressional action, and expansion would require more funding. In an “Era of the Tight Budget,” he noted, “we can’t do all that we would like to do.”⁷³

Busey encouraged FAA employees to volunteer their time to help with aviation educational activities. He issued a new aviation education policy statement that emphasized aviation education as an integral element of the agency’s mission and essential to carrying out its responsibilities of promoting aviation and flight safety. The FAA’s expanded effort and scope, he wrote, “focuses on the general public, through partnerships with the private sector, states, and communities; pilots, mechanics, and other airmen; colleges and universities; as well as public and private schools at all levels.” The program’s purpose, explained Busey, centered on ensuring that everyone understands and “respects the economic importance of aviation at the national and community levels.”⁷⁴

During Busey’s tenure, the FAA established formal partnerships with a number

⁷² Ibid., iii, and appendices APA Program No. 22 and AGI Program Nos. 3 and 5.

⁷³ Remarks for Adm. James B. Busey, FAA Administrator, Aerospace Education Center, Little Rock, Arkansas, Apr. 12, 1991, FAA History Archives, Folder III 11i.

⁷⁴ FAA, *Federal Aviation Administration Aviation Education Program and Materials* (Washington, DC: Federal Aviation Administration, ca. 1990), FAA History Archives, Folder III 11i.

of organizations, such as the National Association of State Aviation Officials, the Helicopter Society of America, the Helicopter Association International, and the General Aviation Manufacturing Association.⁷⁵ The agency subsequently partnered with the Aircraft Owners and Pilots Association, Aircraft Electronics Association, National Air Transportation Association, the Opportunity Skyway program, and the National Coalition for Aviation Education. As Phillip Woodruff, then the FAA’s director of aviation education, explained, “The common element in all of our programs is that we aspire to accomplish them in cooperation with other government entities, and leaders in education and industry.”⁷⁶

These partnerships resulted in very specific outreach activities. For example, the FAA, along with a number of other aviation organizations, became a sponsor of the International Science and Engineering Fair. The sponsor organizations provided scholarships and awards that recognized the achievements of high school science and engineering projects.⁷⁷ The International Aviation/Space Art Contest provided national and international awards for art projects completed by students ranging in age from 5 through 16.⁷⁸

The FAA also reached out to public magnet schools, whose specialized curricula were becoming more popular in the late 1980s and early 1990s. In 1991, the first national aviation magnet school survey identified just nine high schools with aviation programs. To encourage more aviation-related programs, the FAA held a national aviation magnet school conference in cooperation with the Little Rock, Arkansas, School District in November of 1991. The agency sponsored a second conference a year later in Phoenix, Arizona, in cooperation with the Phoenix Unified School District. Based on input for attendees at both conferences, in 1993 the FAA published a curriculum guide for secondary aviation magnet schools.⁷⁹

When the aviation education program moved from the Office of Public Affairs to the Office of Training and Higher Education in October 1992, the assistant administrator for Human Resource Management conducted an assessment of the

⁷⁵ “Partners in Education,” FAA Headquarters *Intercom* (Dec. 26, 1989); Woodruff (Feb. 14, 1991); “A Proclamation by the Federal Aviation Administration and the General Aviation Manufacturers Association Establishing a Partnership in Aviation Education and Public Awareness” (Nov. 1990), FAA History Archives, Folder III 11i.

⁷⁶ Remarks by Phillip Woodruff, Aviation Education Issues Luncheon, Aviation Education Issues Conference, Feb. 14, 1991, FAA History Archives, Folder III 11i.

⁷⁷ Stickler, *Magnet Schools Programs*, 12–13.

⁷⁸ *Ibid.*

⁷⁹ *Ibid.*

program to determine the most efficient use of limited resources. According to that assessment, the key goals of the program were to educate the general public about the value of the aviation industry; promote positive relationships between the FAA and the aviation industry; promote interest among young people of all school ages in aviation careers in order to develop a pool of qualified people for FAA and industry, with a focus on women and minorities as future employees; and use aviation as a theme to help improve math and science education.

The evaluators noted that the program was accomplishing its goals, but expressed concern that current budget cuts would “make it difficult to sustain many of the . . . initiatives just when recent ground work has been completed and firm programmatic bases have been established.” Overall, they recommended the program be reengineered to define what resources and strategies could be applied to maintain program momentum and suggested program coordinators work with external organizations to leverage resources and develop measurable objectives that would help evaluate program effectiveness.⁸⁰

With shrinking resources for non-operational activities, FAA support of the aviation education program declined during the mid- to late-1990s, and its education coordinators increased outreach efforts to external aviation organizations. In 1998, along with representatives of numerous aviation groups, teaching institutions, federal and state agencies, and businesses, the FAA helped create the National Aviation and Space Education Alliance (NASEA), which ultimately included representatives from across the United States.⁸¹ With FAA encouragement, and recognizing that “in view of the loss of FAA funding of publications, ACE academies, and other historical activities,” the NASEA facilitated partnership opportunities and helped with fund-raising activities to support aviation education programs.⁸²

In 1998, the Alfred L. and Constance C. Wolf Aviation Fund, established to support worthwhile general aviation projects, became involved in aviation education

⁸⁰ Mark Palmisano and Paul Twohig, “Evaluation of the Aviation Education Program,” Report for the Assistant Administrator for Human Resource Management, Nov. 28, 1994. FAA History Archives, File III 11i.

⁸¹ National Coalition for Aviation Education website, <http://www.aviationeducation.org/html/utilities/aboutncae.htm> (accessed Apr. 5, 2010); NASEA: National Aviation and Space Education Alliance, “Draft Report, First Meeting, Jun. 19, 1998,” FAA History Archives, File III 11i.

⁸² “History and Goals,” National Aviation and Space Education Alliance, <http://www.nasea.org/goals.htm> (accessed Apr. 6, 2010).

activities to fill the vacuum created by federal budget cuts to education programs. As the organization’s managers explained, “because of federal budget cuts FAA and CAP have been under increasing financial pressure. FAA has dropped from its budget funding for published materials, the camps, and even reasonable travel expenses for the aviation education coordinators.”⁸³

With the FAA’s attention focused on increasing public and congressional concerns over safety, budgets, and the need for air traffic control modernization, aviation education activities fell increasingly on the shoulders of the agency’s regional education coordinators. When Phillip Woodruff retired as the agency’s director of aviation education during FY 2000, the FAA did not fill the position at headquarters.⁸⁴

In March 2000, the assistant administrator for Regions and Center Operations assumed management of the program, and in December 2001 the FAA Administrator officially gave the organization responsibility for aviation education.⁸⁵ The assistant administrator assigned aviation education leadership responsibilities to the New England regional administrator, who designated a new national aviation program manager.

Under its new manager, the FAA’s aviation education program began a series of activities to get students and teachers involved in celebrating 100 years of flight. The FAA participated on the U.S. Centennial of Flight Commission and tied the FAA’s educational initiatives directly to the Commission’s work. The combined outreach efforts of the Commission and its partners reached millions of students during the year-long celebration.⁸⁶

⁸³ Alfred L. and Constance C. Wolf Aviation Fund, <http://www.wolf-aviation.org/education.htm> (accessed Apr. 6, 2010).

⁸⁴ After Woodruff’s retirement, the National Aeronautics Association awarded him the 2003 Brewer Trophy “For exceptional service and dedication in the promotion of aerospace education on a national and international basis, and for building coalitions and programs that support educational objectives.” National Aeronautics Association, “Brewer Trophy,” <http://www.naa.aero/html/awards/index.cfm?cmsid=146> (accessed Mar. 31, 2010).

⁸⁵ Memorandum of Agreement between Assistant Administrator for Human Resource Management and Assistant Administrator for Regions and Centers Regarding The Aviation Education/Garrett A. Morgan Outreach Program, Feb.–Mar. 2000, and Order 1250.2 referenced in Memorandum of Understanding Between the Federal Aviation Administration Associate Administrator for Commercial Space Transportation and SPACETEC, Oct. 27, 2004, FAA History Archives, File III 11i.

⁸⁶ U.S. Centennial of Flight Commission, “Final Report for the Centennial of Flight Commemoration,” Section 3, Apr. 2004 <http://www.centennialofflight.gov/about/2004NilPlan/sec3.htm> (accessed Aug. 30, 2010).

The FAA's education coordinators also supported the Garrett A. Morgan Technology and Transportation Futures program created by Secretary of Transportation Rodney Slater in 1997. As Norman Mineta, Slater's successor, explained, the program was designed to build a bridge between America's youth and the transportation community, support deployment of improved education technology, and ensure that America's transportation workforce is technologically literate and internationally competitive. He said it "is time to refocus our resources toward expanding our relationships with students through increased mentoring, tutoring, holding student and faculty summer enrichments, job shadowing, and encouraging our industry partners to help."⁸⁷

The need to develop and maintain a technologically literate and internationally competitive workforce, especially within the aviation community, became a major theme during the George W. Bush Presidential administration. In July 2001, the President established the Commission on the Future of the United States Aerospace Industry and gave it until March 2002 to provide recommendations. In its final report, the Commission warned, "Our policymakers need to acknowledge that the nation's apathy toward developing a scientifically and technologically trained workforce is the equivalent of intellectual and industrial disarmament, and is a direct threat to our nation's capability to continue as a world leader." To combat this apathy, the Commission recommended that "the nation . . . promote the growth of a scientifically and technologically trained U.S. aerospace workforce . . . [and] address the failure of the math, science and technology education of Americans."⁸⁸ With limited resources, the FAA continued to rely on external partnerships to help carry out its education mission. In 2001, it signed a memorandum of understanding with the Organization of Black Airline Pilots and renewed that agreement in 2008.⁸⁹ The agency also signed an agreement with its long-standing education partner, the CAP in 2004, as well as with Youth Aviation Adventure in 2008.⁹⁰

⁸⁷ "A Message from Secretary Mineta," no date, FAA History Archives, File III 11i; Shelia Bauer, phone conversation with Theresa Kraus, Aug. 17, 2010. For its efforts under the Garrett Morgan program, the FAA aviation education program received the Secretary of Transportation's Gold Medal Award for reaching out to over one million students.

⁸⁸ *Anything, Anytime, Anywhere, Final Report of the Commission on the Future of the United States Aerospace Industry*, Nov. 2002, 8-1, 8-12, http://trade.gov/static/aero_rpt_aero_commission.pdf (accessed Aug. 18, 2010).

⁸⁹ Memorandum of Understanding between the Federal Aviation Administration and the Organization of Black Airline Pilots, Jan. 24, 2008, FAA History Archives, Folder III 11i.

⁹⁰ Memorandum of Understanding between Federal Aviation Education Outreach Program and Civil Air Patrol Aerospace Education Program, Oct. 12, 2004, and Memorandum of Understanding between the Federal Aviation Administration and Youth Aviation Adventure, Apr. 22, 2009, FAA History Archives, Folder III 11i.

On January 12, 2005, the FAA renamed its aviation education program as the Aviation and Space Education Program (AVSED). The newly named program expanded upon earlier program goals that were aimed to encourage students to explore aerospace careers; promote the skills and knowledge necessary for aviation careers; emphasize the FAA’s responsiveness to national and aviation challenges; increase awareness and understanding of the agency’s role in the aviation and aerospace communities; and promote the role of commercial space transportation.⁹¹ By adding commercial space transportation to the aviation education mission, the FAA acknowledged the long-term, ongoing education activities of its Office of Commercial Space Transportation, which had been working with students to explore the connection between math, science, and technology.⁹²



An FAA volunteer oversees “flight tests” at an education event.

In his State of the Union Address on January 31, 2006, President George W. Bush announced the American Competitiveness Initiative. He intended the initiative to address shortfalls in federal government support of educational development in the science, technology, engineering, and mathematics (STEM) fields. NASA took the lead on promoting STEM educational activities. In May 2007, the FAA partnered with NASA to develop the next-generation aviation and aerospace workforce using STEM education.⁹³ As then–assistant administrator for Region and Center Operations Ruth Leverenz explained, “NASA and FAA share a common and critical goal of cultivating a diverse, qualified workforce that will develop, manage, and operate the next generation air traffic and transportation system.”⁹⁴ She pointed out, “Our aim is not just to launch planes . . . but to launch

⁹¹ FAA Order 1250.2A, Jan. 12, 2005, <http://www.faa.gov/documentLibrary/media/directives/ND/ND1250-2A.pdf> (accessed Apr. 5, 2010).

⁹² “Commercial Space Transportation Education Outreach,” http://www.faa.gov/about/office_org/headquarters_offices/ast/education/ (accessed Apr. 6, 2010).

⁹³ Memorandum of Understanding between the Federal Aviation Administration and the National Aeronautics and Space Administration Concerning a Partnership to Promote Aviation and Space Education, May 9, 2007, FAA History Archives, Folder III Ili.

⁹⁴ *FAA FY 2007 Performance and Accountability Report* (Washington, DC: Federal Aviation Administration, 2008), 10, http://www.faa.gov/about/plans_reports/media/FAA%20FY%2007%20PAR%20FINAL.pdf (accessed Apr. 6, 2010).



Smart Skies air traffic simulator.

dreams.”⁹⁵ The partnership’s first major activity was an air traffic control simulation software package called “Smart Skies,” for fifth- through ninth-grade students. Developed by NASA and FAA air traffic controllers at the Oakland air route traffic control center, Smart Skies used air traffic simulation to teach abstract thought and algebraic skills. To ensure that the FAA-cosponsored ACE academies met STEM mandates, in 2007 the FAA issued a new “ACE Academy Director’s Guide.” The guide addressed STEM needs by providing examples of aerospace thematic STEM curriculum and mandating its use as a requirement for FAA cosponsorship.⁹⁶

Hoping to get higher visibility for its aviation and space education activities, the FAA, for the first time, mentioned the aviation education program in its strategic *2006–2010 Flight Plan*. And the *2007–2011 Flight Plan* included a new aviation education initiative: “to focus and refine the Aviation and Space Education Program to integrate aerospace applications into existing scientific, technical, engineering and mathematical (STEM) curricula.” The strategy, however, had no performance targets or budget associated with it.⁹⁷

A 2010 General Accountability Office study on federal funding of kindergarten-through-12th-grade educational activities found that FAA-dedicated funding for its aviation and space education program was \$0 in 2006, \$0 in 2007, and \$24,000 in 2008.⁹⁸ With no dedicated resources for education programs, the agency continued to rely heavily on the volunteer efforts of its employees to carry out its aviation and space education activities. FAA employees served as informal education

⁹⁵ Ibid.

⁹⁶ “Director’s Guide, FAA Aviation Career Education Academy,” 2007, FAA History Archives, File III 11i.

⁹⁷ *FAA Flight Plan 2007–2011* (Washington, DC: Federal Aviation Administration, 2007), 46, http://www.faa.gov/about/plans_reports/media/flight_plan_2007.pdf (accessed Apr. 6, 2010).

⁹⁸ *Federal Education Funding: Overview of K-12 and Early Childhood Education Programs* (Washington, DC: General Accountability Office, GAO-10-51, Jan. 2010), 29.

ambassadors, providing facility tours to local children, volunteering in schools, tutoring students in after school programs, and serving as mentors. As FAA Administrator Marion Blakey explained in 2007, “Our aviation education program . . . [has] staged more than 3,300 events over the last four years, reaching more than 81,000 students and 57,000 teachers. . . . [M]ost of this was done by FAA employees who volunteered their time.”⁹⁹

* * *

Since 1935, the FAA’s aviation education program has evolved from a well-funded initiative to ensure that U.S. citizens understood the benefits of aviation and that the country had sufficient pilots for deployment in World War II, to a program largely based on employee volunteers willing to donate their time and efforts to introduce school children to aviation topics. From a program established to train aviators, to one designed to air condition youth and raise public awareness of the FAA, it became a program that focuses on the broader mission of encouraging the study of math and science for K-12 students. With limited resources, FAA aviation education specialists and volunteers keep the program viable through partnerships with the aviation community and other federal agencies and cosponsorship of aviation enrichment activities, such as aviation career education academies, facility tours, workshops, and school visits.

For the FAA, an agency whose primary mission has always focused on the operation of a safe and efficient air traffic control system, maintaining an active education outreach program has required an evolutionary approach dictated by national need, technological advances, and agency resources.

Originally created to meet the needs of a society increasingly dependent on air services, the agency has refocused the program over time from one dedicated to educating the public and students about the benefits of aviation, to informing the public about the FAA’s mission and goals, to training new aviation workers, and, today, to promoting science, engineering, and math education at all scholastic levels.



⁹⁹ Marion Blakey, “Remarks at Town Hall 2007,” http://www.faa.gov/news/speeches/news_story.cfm?newsId=9492 (accessed Apr. 5, 2010).

Despite expanding and then contracting federal budgets, the FAA found innovative ways to maintain its educational program. Scarce budgets and programmatic cuts compelled the agency to find new ways to maximize efforts and achieve its educational goals through partnerships with other federal agencies, industry, and nonprofit groups and by encouraging employees to volunteer at local schools. Overall, the history of the FAA's aviation education program is one of adaptability—a willingness to meet evolving needs despite a lack of dedicated resources. Furthermore, it provides a good example of how one agency maintained a small but effective outreach program from era to era, despite fluctuating economics, redefined national and agency policy priorities, and social needs.

Photo credit: Federal Aviation Administration