U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, DC 20591

October 28, 2020

The Honorable Roger Wicker
Chairman, Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

This letter encloses the report to Congress from Federal Aviation Administration (FAA) on the progress in meeting the requirements of Section 569 of the FAA Reauthorization Act of 2018, Public Law 115-254.

In Section 569 of the FAA Reauthorization Act of 2018, Congress directed the FAA to submit a report describing the progress made toward implementing the FAA's action plan to attract, develop, and retain a talented technical workforce in the areas of systems engineering, architecture, systems integration, digital communications, and cybersecurity.

We have sent identical letters to Chairman DeFazio, Senator Cantwell, and Congressman Graves.

Sincerely,

Steve Dickson
Administrator

Enclosure

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**Federal Aviation
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800 Independence Ave., S.W.
Washington, DC 20591

October 28, 2020

The Honorable Peter A. DeFazio
Chairman, Committee on Transportation and
Infrastructure
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

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800 Independence Ave., S.W.
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The Honorable Maria Cantwell
Ranking Member, Committee on Commerce,
Science, and Transportation
United States Senate
Washington, DC 20510

Dear Senator Cantwell:

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800 Independence Ave., S.W.
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October 28, 2020

The Honorable Sam Graves
Ranking Member, Committee on Transportation
and Infrastructure
House of Representatives
Washington, DC 20515

Dear Congressman Graves:

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U.S. Department of Transportation

Federal Aviation Administration

Section 569 Report on Attracting, Developing, Training, and Retaining FAA's Technical Workforce

In the Areas of Systems Engineering, Architecture, Systems Integration, Digital Communications, and Cybersecurity

Version 3.0

September 24, 2020

Response to U.S. Congress
FAA Reauthorization Bill
Public Law / P.L. 115-254
Section 569

Table of Contents

1. Introduction

1.1. Section 569

Section 569 of the Federal Aviation Administration (FAA) Reauthorization Act of 2018, Public Law (P.L.) Number 115-254 states:

(a) IN GENERAL - Not later than 1 year after the date of enactment of this Act, the Administrator shall—

(1) Identify and assess barriers[1] to attracting, developing, training, and retaining a talented workforce in the areas of systems engineering, architecture, systems integration, digital communications, and cybersecurity;

(2) Develop a comprehensive plan to attract, develop, train, and retain talented individuals in those fields; and

(3) Identify existing authorities available to the Administrator, through personnel reform, to attract, develop, and retain this talent.

REPORT.—The Administrator shall submit to the appropriate committees of Congress a report on the progress made toward implementing the requirements under subsection (a).

Note that this Reauthorization Section, 569, relates closely to FAA Reauthorization Section 549, which directs the FAA to enter into an agreement with the National Academy of Sciences to conduct a study to develop recommendations to increase the size, quality, and diversity of the cybersecurity workforce.

1.2. Report Structure

In Sections 1.3-1.6, we provide an overview of the occupational series analyzed to develop this response followed by high-level summaries of the FAA's (1) challenges to attracting, developing, training, and retaining the technical workforce, (2) action plan to attract, develop, train and retain these individuals and (3) hiring authorities available to acquire this talent. Section 2 describes the FAA's accomplishments made toward implementing the action plan.

[1] In this request, the FAA interprets the term "barriers" to mean challenges or conditions that make it difficult to achieve an objective

1.3. Occupational Series Considered in the Analysis

Table A shows the composition of the FAA Technical Workforce included in this analysis and tracks the change in number of personnel from the end of Fiscal Year (FY) 2016 through FY 2019. There have been increases and decreases in these job series, consistent with changes in the work requirements.

Table A – Composition of FAA Technical Workforce[2]

Occupational Series	Title	Number On Board at the End of FY 2016	2017	2018	2019	% Change 2016-EOFY 2019
0391	TELECOMMUNICATIONS	61	60	57	57	-7%
0801	GENERAL ENGINEERING	857	900	879	903	5%
0808	ARCHITECTURE	15	17	14	14	-7%
0830	MECHANICAL ENGINEERING	113	128	120	216	91%
0850	ELECTRICAL ENGINEERING	120	121	118	138	15%
0854	COMPUTER ENGINEERING	74	78	75	77	4%
0855	ELECTRONICS ENGINEERING	756	750	716	715	-5%
1035	DIGITAL COMMUNICATIONS	18	16	16	18	0%
1515	OPERATIONS RESEARCH	180	175	163	166	-8%
1550	COMPUTER SCIENCE	231	244	245	252	9%
2210	INFORMATION TECHNOLOGY MANAGEMENT	1533	1529	1486	1418	-8%

Table B displays the distribution of technical workforce across the lines of business as of April 30, 2020.

Table B – Distribution of the Technical Workforce across FAA Lines of Business[3]

	Occupational Series											
Line of Business	**0391**	**0801**	**0808**	**0830**	**0850**	**0854**	**0855**	**1035**	**1515**	**1550**	**2210**	**Total**
Finance and Management (AFN)	8	25	9	10	3	7	48		27	11	765	913
Next Gen (ANG)	2	163	2	7	7	11	101		28	88	94	503
Communications (AOC)								13			1	14
Policy, International Affairs & Environment (APL)		11							2			13
Airports (ARP)		3					3		2		1	9
Security and Hazardous Materials Safety (ASH)	1											1
Commercial Space Transportation (AST)		1										1
Air Traffic Organization (ATO)	43	678	3	202	140	52	558		39	150	554	2419
Aviation Safety (AVS)		42		3		4	2	2	63	2	4	122
Total	**54**	**923**	**14**	**222**	**150**	**74**	**712**	**15**	**161**	**251**	**1419**	**3995**

Source: FPPS as of April 30, 2020

[2] Source: Federal Personnel Payroll System (FPPS)
[3] Source: Federal Personnel Payroll System (FPPS)

1.4. Challenges to Attracting, Developing, Training, and Retaining the FAA's Technical Workforce

Attracting/Hiring

It is more difficult today for the FAA to hire technical talent as quickly and effectively than in the past. The FAA's current challenges to hire qualified technical candidates include the following:

- The FAA frequently loses candidates to the private sector because the Federal hiring process is lengthy and the pay is lower.[4] On average, the private sector pays 35 percent more than the public sector for cybersecurity jobs, with entry-level positions paying an average of 45 percent to 150 percent more in the private sector.[5] Therefore, the private sector recruits and retains the majority of available talent, leaving a small pool of high value candidates.
- The FAA competes with other public sector agencies for talent.
- There have been three government shutdowns in the past six years, causing candidates to view Federal employment as less stable than it used to be.

Of particular consideration are the technical jobs pertaining to cybersecurity. With a predicted 3.5 million cybersecurity job openings worldwide by 2021, there is not a sufficient supply of cybersecurity talent to meet the demands of all commercial, non-profit, and government organizations.[6]

Training and Development

When polled about challenges to training and developing the technical workforce, a couple Lines of Business (LOBs) cited minor concerns. The Air Traffic Organization (ATO) has experienced some barriers to provide adequate training for engineering series 830, 850, and 855. Specifically, Technical Operations training was programmed primarily for Occupational Series 2101, Airway Transportation System Specialists, with no means for an engineer to request quota through the traditional call for training process. As a result, engineering employees typically receive a slot for training when Technical Operations is unable to fill a class.[7] In addition, representatives from the Cybersecurity Steering Committee indicated that while there is a host of no-cost and low-cost training programs available, due to workload demand LOBs struggle to find time for employees to attend training.

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[4] The Federal Hiring process has different rules than the private sector. OPM has provided guidance that agencies should hire within 80 days. There is not an industry standard to compare to due to the uniqueness of these positions.

[5] https://careersincybersecurity.com/private-sector-may-offer-better-cyber-security-salary-benefits-challenges/

[6] Cybersecurity Jobs Report, https://cybersecurityventures.com/jobs/

[7] This challenge was identified by stakeholders, but progress has been made since the original development of this report. See Section 2.2.

Retention –

The FAA seeks input from separation surveys and the Federal Employee Viewpoint Survey (FEVS) to analyze and remedy the reasons why people may leave their jobs. While the FAA has begun to collect some data, the separation survey currently collects data for the telecommunications series of occupations (series 334/2210, 1550, and 391). Over the past three years, data indicates that the primary reasons for this series to leave are (1) work life balance / personal life priorities (such as to pursue personal interests or to prioritize family responsibilities); and (2) compensation and benefits; specifically, in 2017 pay was the primary driver in this category, but 'retirements benefits' replaced this category in years 2018 and 2019. In general, the FEVS indicates that these are the top four reasons for voluntary separation over the past three years, for all series, in order of importance: Performance Recognition and Reward, job resources, collaborative management, and training and development.

When polled, the ATO, Office of Aviation Safety (AVS), and NextGen (ANG) responded that the primary barrier to retention is salary. The FAA loses employees to higher paying companies in the private sector after gaining a year or two of experience with FAA. However, once employees pass the two-year threshold, the FAA has a strong technical workforce retention rate. Table C shows the tenure in position, average number of years at the FAA (and in Federal Government), and the average age for each generational breakdown of the FAA's technical workforce analyzed for this report. The average time of employment at the FAA for employees in technical positions is 15.7 years.

Table C – Tenure and Age of the FAA Technical Workforce[8]

Average Tenure and Age of the FAA Technical Workforce					
Generations	Percent of Technical Workforce Population	Avg. Years in Current Position	Avg. Years at FAA	Avg. Years in Federal Govt	Avg. Employee Age
Traditional (<1945)	0.5%	5.2	26.8	30.4	76.1
Baby Boomer (1946-1964)	42%	3.4	20.2	24	59.7
Generation X (1965-1981)	44%	2.5	14.8	17	47.8
Millennials (1982-1996)	14%	1.2	4.5	5.3	31.2
Generation Z (>1997)	0.03%	0	0	0	22
Overall Averages		2.7	15.7	18.3	50.7

1.5. Overview of FAA's Action Plan for Attracting, Developing, Training, and Retaining the FAA's Technical Workforce

The FAA developed an action plan to address the challenges it faces with respect to the technical workforce. According to this plan, the best actions to address the challenges are:

- **Recruitment** - increase the recruitment efforts for the technical workforce by collaborating with internal and external stakeholders, using multiple mediums for outreach, and capturing metrics on the effectiveness of our recruitment strategies so that we can identify the most effective methods to attract and retain talent. The FAA should also focus on recruiting youth to build the FAA's pipeline of technical talent.

[8] The Technical Workforce included in this table represents the series shown in Table A

Specifically, the FAA should focus primarily on college-age students and high school students, but also reach out to middle school students as appropriate.

- **Hiring** - The use of special hiring authorities, including (On-the-Spot) OTS hiring, will help with the lengthy governmental hiring process. The agency will also explore expanding the use of compensation flexibilities for technical talent.
- **Development/Training** - To increase both development of the technical workforce, the FAA will construct career maps for its key technical positions to illustrate the knowledge, skills, characteristics, and experience needed to progress into these roles, and outline training requirements. To address the training shortfalls within the ATO, Technical Operations must address the needs, identify gaps, and develop new courses.
- **Retention** – The FAA must attempt to hire the right people that align closely to the mission and have the best motivational fit, regardless of the position. The FAA will continue to focus on improving issues highlighted in the FEVS survey each year, and use the data from FEVS and separation surveys as appropriate to consistently review its benefits packages and make adjustments accordingly. Finally, the FAA will focus on career pathing and training, including leadership development and leadership training as discussed above as a means of ensuring employee satisfaction and longevity, especially for its critical and hard-to-fill positions.

1.6. Existing Authorities Available to the Administrator to Attract the Technical Workforce

The FAA uses OTS hiring for external permanent, temporary, or time-limited appointments (as outlined in separate policy supplements) when it is determined there is a severe shortage of candidates, a critical hiring need for a position (or group of positions), or when an individual meets the requirements under a special appointing authority.

Table D summarizes the FAA's OTS hiring authorities and special appointing authorities for technical positions.

Table D – OTS Hiring and Special Appointing Authorities for the Technical Workforce

OTS Hiring for Scientific, Technical, Engineering, and Mathematics (STEM) ***as of 9/2019***		
Occupation	**Series**	**Grade or Band Level**
Engineer	All 0800 series (excluding 0802, 0808, 0856)	All grades/bands
Statistician	1530	FG 11-15 and FV H-K
Cybersecurity		
Engineer (Cybersecurity-Related)	0800 series (excluding 0802, 0808, 0856)	FG-5,7, and 9 FV-G
Computer Engineer (Cybersecurity)	0854	FV H-K and FG 12-15
Electronics Engineer (Cybersecurity)	0855	FV H-K and FG 12-15

Computer Scientist (Cybersecurity)	1550	FV H-K and FG 11-15
Information Technology (IT) Specialist (Cybersecurity)	2210	FV G-K and FG 9-15
Special Appointing Authorities		
Authority	**Series**	**Grade or Band Level**
Veterans' Recruitment Appointment	All series	Up to FG-11 (or equivalent in Core Compensation)
30% or More Disabled Veteran Program	All series	All grades/bands
Permanent Noncompetitive Appointments for Spouses of Certain Members of the Armed Forces	All series	All grades/bands
Recruitment and Appointment of Persons with Disabilities, Severe Physical Disabilities, Psychiatric Disabilities, and Intellectual Disabilities	All series	All grades/bands
Returned Peace Corps Volunteers/Present and Former Peace Corps Employees/Americorps Volunteers-in-Service-to-America	All series	All grades/bands

2. Progress Made Toward Implementing the Action Plan

This section highlights the FAA's achievements to date in fulfilling the intent of its action plan to attract, hire, develop, train, and retain its technical workforce in the fields of systems engineering, architecture, systems integration, digital communications, and cybersecurity.

2.1. Recruitment

The FAA's action plan includes a goal of working with multiple internal and external agency partners to customize recruitment efforts for specific technical groups by occupation and key skillsets. Toward that end, the FAA's Corporate Recruitment Team developed a recruitment strategy that prioritizes efforts and resources around the FAA's most critical requirements, with two of the top five mission essential occupational targets being engineers (all types) and cybersecurity professionals. Accomplishments in this area include:

1. **FAA Recruitment Council** –During the third quarter of FY 2019, the FAA formed an enterprise-wide Recruitment Council designed to collaborate on recruitment priorities across the FAA, harmonize communications, establish a common calendar, create efficiencies, share resources, consolidate efforts, and measure results. The Recruitment

Council meets on at least a bi-monthly basis and includes membership from all major LOBs/Staff Offices (SOs), including the ATO diversity office (Air Traffic and Tech Ops), the Office of Commercial Space Transportation (AST), AVS, the Office of Finance and Management (AFN), the Office of Security and Hazardous Materials Safety (ASH), the Office of Civil Rights (ACR) and the Office of Human Resource Services (AHR). Thus far, the Recruitment Council has increased participants' awareness of FAA-wide recruitment plans and endeavors, and facilitated the sharing of resources to cover key recruitment events to include events for engineers. The Recruitment Council is currently finalizing its charter and standard operating procedures.

2. **In-Person Events** – FAA representatives attended recruitment events, job fairs, and outreach initiatives aligned with 2019 and 2020 priorities, most of which deal with STEM recruitment, including, but not limited to:[9]
    - American Indian Science and Engineering Society 3-day National Conference in Oklahoma, October 2018.
    - Women of Color STEM Conference (3-day event), in Detroit, MI October 2018.
    - Hire Our Heroes Virtual Career Fair; February 2019 and August 2020. Candidates had backgrounds in many fields, with a heavy focus on Information Technology, Engineering, and Cyber Security.
    - Women in Aviation Conference; March 14-16, 2019, Long Beach, CA
    - 25th Annual THINGAMAJIG Invention Convention, July 25. STEM-inspired. Over 1,000 students attended, ranging from age 4 to 15.
    - Organization of Black Aerospace Professionals (OBAP) Conference 2019. Approximately 4000 candidates attended (Over 600 college students and over 200 K-12 age range). Additionally, attended the OBAP STEM panel discussion in August 2020.
    - Hosted a STEM Symposium at FAA in September 2019
    - National Society of Black Engineers 46th Annual Convention, August 2020
    - Attended over a dozen additional virtual career fairs in 2020
    - Engineering, Science, & Technology – Virtual Career Fair, 2020
    - University of Maryland – Engineering Department Virtual Career Fair, 2020
    - Attended over a dozen additional virtual career fairs geared toward all occupations during the national health emergency
    - Visited high schools (two in FY19 and four in FY-20 before the national health emergency) and universities (five in FY19 and three in FY20 prior to the national health emergency) to establish partnerships and discuss FAA careers and internship opportunities, including the University of the District of Columbia's School of Aviation, and J.M. Lunsford school in Chantilly, VA (attended STEM day).[10] The FAA uses these types of recruitment events to create awareness of the FAA and the types of jobs it offers, including technical positions. The FAA may bring students onboard via the Minority Serving Institution Internship Program and the Gateways Program. Over the past five years the FAA has hosted over 600 interns in the MSI and Gateways programs. Nearly 10% result in

[9] The team was unable to attend events during the government shutdown from December 21, 2018 to January 28, 2019, and once regular work resumed, it took additional time to get back on track and obtain funding approval for events and materials.

[10] Recall that the government furlough prohibited these activities between late December 2018 and March 2019.

temporary or Not-to-Exceed appointments to the Agency. A total of 53 were hired during this timeframe, most into STEM positions.

3. **Minority Serving Institution (MSI) Intern Program** – Another achievement toward implementing the FAA's action plan is the expansion of the MSI Intern Program, which offers fall, spring, and summer internships. Students major in a wide variety of career fields, including computer science and engineering. For FY2020, the FAA hosted 110 students for the summer internship program, 30 of which were majoring in computer science, cybersecurity, or engineering. In FY 2019, the FAA hosted 85 summer students, of which 9 were majoring in computer science, cybersecurity or engineering. In FY 2018 FAA hosted 35 interns, 9 of which were majoring in engineering, cybersecurity, or computer science.
4. **STEM Outreach** – The FAA has implemented several steps to meet its goal of attracting youth into aviation-related technical careers. In 2018, the Committee on STEM Education (CoSTEM) issued the Federal government's five-year STEM education strategic plan, which calls upon agencies to partner with stakeholders at all levels to remove barriers to STEM careers, especially for women and other underrepresented groups. It also encourages the collaboration of stakeholders in STEM ecosystems that unite a broad range of non-Federal partners, such as preK-12 schools, community colleges and universities, employers, nonprofit organizations, and other workforce development organizations. In FY 2020, the FAA received DOT approval for six Aviation Workforce and Education Representatives stationed in FAA's regional offices. These positions will support this mission and serve as liaisons to stakeholders such as academia, government agencies, and aviation industry organizations, associations and professional groups for the FAA's National Aviation and Space Education (AVSED) Program and the FAA Aviation Workforce Steering Committee. In addition, the FAA is training interested personnel to serve as agency STEM outreach representatives at events such as trade shows, school events, and career fairs. In FY 2019, 786 representatives completed training, and the FAA met its target to attend 600 recruitment events. In FY 2020, the FAA set a goal of having 1,167 employees complete the outreach representative training. In FY20 FAA trained 1,426 outreach representatives, and conducted 640 outreach activities that reached over 81,000 total attendees, over 64,400 of which were students of all ages.

In addition, pursuant to Section 602 of Public Law (P. L.) 115-254, the FAA drafted a charter, which was signed by the Secretary of Transportation in September 2019, to form a "Youth in Aviation Task Force" to develop and provide strategies to encourage high school students to complete technical education courses, including STEM. The task force, which will begin meeting in October 2020, will include representatives from industry and education, including airlines, aircraft, power plant and avionics manufacturers, aircraft repair stations, local educational agencies, high schools, and institutions of higher learning. Additionally, in April 2020, the FAA Aerospace Workforce Steering Committee (AWSC) launched a STEM AVSED Work Group to analyze and make strategic recommendations for the STEM AVSED Program. To maintain efficiency, the 48-member Work Group formed three Sub Groups: Strategic Plan, Governance and Structure, and Resource Requirements. The Work Group developed a strategic plan for FY 21 – FY24 that outlines the following strategic goals:

- Develop, implement, and support programs to introduce students to aerospace careers and increase the industry pipeline, and ensure students have access to clear pathways to becoming aerospace professionals.
- Create opportunities for students of all backgrounds to learn about and pursue aerospace careers.
- Identify and collaborate with key government, industry, and academic organizations at national, regional, and local levels, and work closely with them to share resources and expertise that support FAA STEM and aerospace education goals.
- Implement FAA STEM and aerospace education efforts on a national, regional, and local level through effective cross-Agency collaboration.

5. **Targeted Outreach** – The third goal in the FAA's action plan for recruitment is to use multiple mediums for outreach, and capture metrics to enable better sourcing. The FAA's Corporate Recruitment Team has continued to work with the Office of Communications to create advertisements for posting on the free digital recruitment sites, paid recruitment services, and job boards. Through sourcing efforts and job boards such as LinkedIn, the FAA can identify candidates who appear to match the qualifications for key open positions. In turn, FAA can reach out to share opportunities and links to live vacancy announcements. The FAA is currently working with LinkedIN to build an FAA career page, and acquire several recruiter seats job slots to match FAA's open position with qualified member profiles. The FAA will capture metrics on the number of opportunities shared and number of views, and if applicable, we can manually track hiring resulting from its sourcing efforts. Additionally, the FAA has a robust recruitment calendar and can get metrics such as the number of attendees through vendor reports.

2.2 Hiring

The FAA has made advancements toward its action plan in several hiring-related areas.

1. **On the Spot hiring -** The FAA has used the OTS authority successfully for hard to fill positions. Specifically, the agency hired over 400 employees using the STEM/Cybersecurity OTS authority since December 2018.
2. **Optimize the Gateways program[11] for engineering and cybersecurity** – The FAA uses the Gateways program to maintain a pipeline of engineers and computer scientists. In FY 2019, ANG, the Program Management Organization (AJM), the Office of Information and Technology Services (AIT), and AVS converted 45 Gateways interns to full-time permanent employees.
3. **Improve the hiring process** – In FY 2019, the FAA examined the overall HR service delivery process and removed redundant and low value actions. Many parts of the agency had been using redundant, time-consuming manual and semi-automated processes. As a result, we have undertaken a robotics initiative to automate HR hiring processes where feasible. Second, the FAA's Human Resource Management office has worked to strengthen the relationship between HR specialists and hiring managers, and

[11] The Gateways program (formerly known as "Pathways") is a succession planning program designed to help government agencies meet their critical needs for leadership continuity by attracting high school through post-graduate level students from diverse backgrounds and disciplines.

initiated a project to provide hiring managers with training on the FAA hiring process. This training will improve the efficiency and effectiveness of the hiring process. Additionally, the FAA is close to issuing revised interviewing policy and launching its structured interviewing program, which includes training. This program will improve the selection process by enhancing the FAA's ability to identify the most capable candidates with the best motivational fit.

4. **80-day hiring target** – The 80-day hiring target is part of the FAA's FY 2019 business plan goals. From FY 2019 through August 1, approximately 73 percent of the hires met the 80-day hiring goal for engineering and computer science/cyber positions. The FAA's Human Resource Management office has worked to strengthen the relationship between HR specialists and hiring managers and initiated a project to provide hiring managers with training on the FAA hiring process. This training will improve the efficiency and effectiveness of the hiring process.
5. **Strategic Workforce Planning (SWP) –** In FY 2019, the FAA stood up its SWP division to assess the current FAA workforce, model the FAA's future workforce needs at the enterprise level, and implement a strategy to close identified workforce gaps. This new division has engaged contract support and hired a Federal staff of four to support this program. The team completed a significant amount of work in its first year including:
   - Performed a workforce planning capability maturity assessment to determine the agency's readiness to adopt SWP, accompanied by a list of recommended actions to increase the maturity of the enterprise workforce planning capability;
   - Conducted a comprehensive environmental scan and baseline assessment of the FAA's 2019 workforce;
   - Identified several specific potential future scenarios that are likely to have a significant impact on the FAA's mission, operating environment, and workforce in the next 3-5 years;
   - Obtained organizational buy in on the most likely and most impactful future scenario, and gathered data requirements to examine its labor impacts;
   - Modeled the chosen future-state scenario and identified the workforce gaps between the current and future state (next 3-5 years) – See Attachment 1; and
   - Developed an action plan to address the shortfalls – See Attachment 2.

6. **Improve cybersecurity hiring via adherence to guidance published in DOT's FY 2018 Cybersecurity Workforce Planning Implementation Guidance Cyber Action Memorandum**. The FAA has identified and categorized all federal cyber-related personnel according to OPM cybersecurity codes/roles. In July 2019, the FAA finalized its update of Federal Personnel Payroll System (FPPS) to reflect the new codes. The FAA routinely gathers data on the number of vacant cybersecurity positions, personnel certification status, and mission criticality and provides this information to the Department of Transportation's Office of Chief Information Officer.

2.2. Training and Development

This section summarizes notable training and development accomplishments.

The FAA's Information Technology office (AIT) has focused on continuous development of knowledge, skills, and abilities (KSAs) linked to its strategic plan and developed 'Career

Opportunity Maps' that identify and describe work roles, determine the competencies associated with each role, and illustrate training opportunities associated with each competency. AIT also created online tools to aid in career planning.

The ATO's Management Service office (AJG) developed online tools consisting of position profiles and career planning guides for its Engineers (occupational series 0801, 0830, and 0855, in pay bands I, J and K) and Program/Project Manager positions (I, J and K pay bands), many of which serve engineering functions. ATO's local service units have begun developing their own engineering career plans. The AJG guides contain:

- Position profiles with position descriptions, examples of job tasks, KSA requirements, performance indicators and a description of 'best fit' characteristics; and
- Development opportunities such as online and classroom training, reading resources, professional organizations, job shadowing, mentoring, and developmental assignments.

For engineering series 830, 850 and 855 in the ATO, Technical Operations is currently working with the technical training organization to assess the courses needed, identify gaps, and develop courses to target this workforce.

For the cybersecurity workforce, the FAA leverages existing tailored cybersecurity training courses from sources such as the National Initiative for Cybersecurity Careers and Studies (NICCS), the Department of Homeland Security (DHS), FedVTE, the General Services Administration (GSA), FedRAMP Blackboard Portal, the Defense Information Systems Agency (DISA), and the US Department of Defense Center for Development of Security Excellence (CDSE). Most of the training is free to government agencies. In particular, NICSS provides a training catalog with a repository of over 3,000 cybersecurity-related courses aligned to the National Cybersecurity Workforce Framework.

The FAA is also exploring contracts with educational providers to meet FAA-specific Cybersecurity training needs. The agency released a Market Survey to solicit feedback to inform an acquisition strategy for the contemplated Cybersecurity Training Initiative (CTI). The objectives of the CTI are to (1) implement a FAA agency-wide cybersecurity professional development and proficiency program and (2) provide FAA cybersecurity personnel with the needed managerial and technical skillset to support and protect current and projected FAA mission requirements.

2.3. Retention

FAA has implemented methods to retain its technical workforce. First, the FAA found that retention is linked to career satisfaction and employee development; therefore, the FAA implemented the training and development initiatives discussed in Section 2.3. In addition, the FAA has continued to review its benefits program and in 2020 initiated a student loan repayment program to both recruit and retain employees in mission critical and hard-to-fill positions. Also, to promote better hiring decisions and ensure best motivational fit, the FAA has kicked off an agency-wide structured interviewing program that will include tools and training for hiring managers.

3. Conclusion

This report presented an overview of the barriers to attracting, hiring, developing, and retaining a pipeline of technical talent; summarized key points of the FAA's action plan to address those barriers; and highlighted the FAA's progress to date toward implementing its action plan. The FAA can claim progress in some areas; however, work is ongoing. For example, the Corporate Recruitment Branch continues to develop and implement annual recruitment plans that align to the FAA's top needs. Plans mirror key steps in the FAA's action plan to recruit the technical workforce, including promoting the FAA as an employer of choice through effective branding, social media marketing, and targeted print campaigns; strengthening existing and developing new partnerships, both internally and externally; and hosting/attending events that target agency priorities including the engineering and cyber workforce. Some specific near-term actions of this year's plan include:

- Planning and hosting a recruitment summit to increase collaboration and awareness by identifying the FAA's most critical needs and bringing together the LOBs to discuss those needs, accomplishments to date, and potential strategies to achieve success.[12]
- Purchasing new tools/memberships to increase the FAA's direct sourcing capabilities to help find strong technical candidates.
- Promoting OTS hiring to hiring managers through reminders on the FAA internal website, advertising and using OTS at career fairs, and implementing new OTS procedures to aid in connecting qualified candidates to the right jobs.

Finally, the FAA anticipates additional progress in attracting and hiring technical positions through collaboration with work groups for other FAA Reauthorization sections that share common objectives such as Section 549 (Study on Cybersecurity Workforce of FAA), Section 601 (Student Outreach Report), Section 602 (Youth Access to American Jobs in Aviation Task Force) and Section 612 (Supporting Women's Involvement in the Aviation Field).

[12] Due to COVID-19, the FAA may consider doing this virtually at some point; however, the FAA is currently at its target levels for most MCOs. The FAA will revisit the summit in FY21.

Appendix A - FAA Reauthorization 569 Acronym List

ACR	FAA's Office of Civil Rights
AFN	FAA's Office of Finance and Management
ANG	FAA's Office of NextGen
AHD	FAA's Office of Talent Development
AHR	FAA's Office of Human Resources
AIT	FAA's Office of Information Technology
AOC	FAA's Office of Communications
APL	FAA's Office of Policy, International Affairs, and Environment
ARP	FAA's Office of the Associate Administrator for Airports
AST	FAA's Office of Commercial Space Transportation
ATO	FAA's Air Traffic Organization
AVS	FAA's Office of Aviation Safety
CTI	Cybersecurity Training Initiative
CWA	Cybersecurity Workforce Act
DISA	Defense Information Systems Agency
DoD	Department of Defense
DoP	Demonstration of Proficiency
DOT	Department of Transportation
FAA	Federal Aviation Administration
FEVS	Federal Employee Viewpoint Survey
GSA	General Services Administration
IT	Information Technology
LOB	Line of Business
NAS	National Airspace System
NextGen	Next Generation Air Traffic Control System
NICCS	National Initiative for Cybersecurity Careers and Studies
NICE	National Initiative for Cybersecurity Education
NIST	National Institute of Standards and Technology
OBAP	Organization of Black Aerospace Professionals
OCIO	Office of Chief Information Officer
OPM	Office of Personnel Management
OTS	On-the Spot (Hiring)
PWD	Persons with Disabilities
POC	Point of Contact
SO	Staff Offices
STEM	Scientific, Technical, Engineering, and Mathematics
SWP	Strategic Workforce Planning