# AVIATION SAFETY

## WORKFORCE PLAN

### 2020 - 2029

**Federal Aviation Administration**

This is the Federal Aviation Administration's (FAA) 13th annual update to the Aviation Safety (AVS) Workforce Plan. This plan provides staffing estimates for all of the FAA's AVS Services and Offices as well as actual on-board levels as of September 2019. This 2020 report incorporates changes in aircraft fleet and operations forecasts, inspector and engineer retirements, and other factors. To meet the requirements of the FAA Reauthorization Act of 2018 (P.L. 115-254), the FAA has prepared an annual AVS Workforce Plan that:
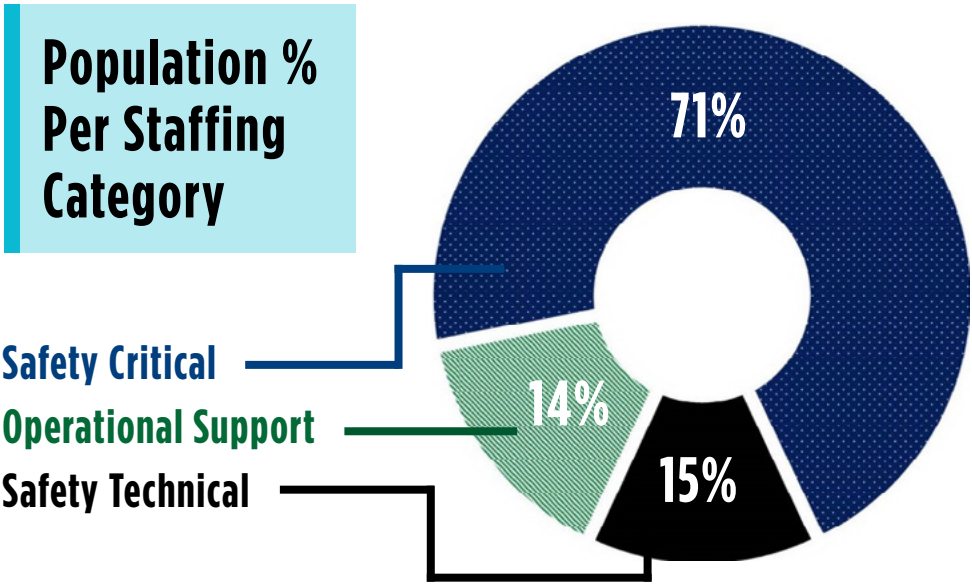
- Provides the background for current staffing levels

- Describes the evolving AVS environment

- Provides a staffing forecast for Aviation Safety Inspectors and Aviation Safety Engineers based on model results

- Forecasts expected attrition and specific hiring targets over a 10-year period

- Details strategies for meeting staffing needs

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# 2019 HIGHLIGHTS

## Over 7,000 Employees
## Over 8,800 Designees
## Over 80 Office Locations

### Population % Per Staffing Category

71%

14%

15%

**Safety Critical**

**Operational Support**

**Safety Technical**

| AIR OPERATOR CERTIFICATES | 5,392 |
|---|---|
| Major U.S. Air Carriers | 80 |
| Commercial Operators | 76 |
| Commuter Air Carriers / On-Demand | 2,197 |
| Foreign Air Carriers | 501 |
| External Load (e.g. Logging, Oil Platform) | 377 |
| Agricultural Operators | 1,845 |
| Public Use Authorities (e.g. State / City / Police) | 316 |

# EXECUTIVE SUMMARY

The Federal Aviation Administration's (FAA) mission is to provide the safest, most efficient aerospace system in the world. In support of this mission, the FAA's Aviation Safety (AVS) organization sets, oversees, and enforces safety standards for any person or product that operates within the National Airspace System (NAS). In executing its responsibilities, AVS embraces the challenges of the ever-dynamic aviation safety environment.

Following the tragic accidents in Indonesia and Ethiopia, the grounding of the Boeing 737 MAX placed a spotlight on safety and the FAA's approach to oversight of those we regulate. Several expert safety panels were convened, and the FAA is committed to using their recommendations to improve our oversight efforts.

## Industry and Technology Updates

The FAA continues to work toward transforming the NAS through the implementation of Next Generation Air Transportation System (NextGen) technologies and the use of a Safety Management System (SMS). This approach addresses industry business changes, technological advances, and the need for greater global harmonization. To stay aligned with these changes, AVS continues to forecast staffing levels and manage changing workload demands. In addition, AVS received, and continues to receive, recommendations from expert review panels that reflect suggested target areas for enhancing the AVS workforce, which are reflected in this year's plan.

## Hiring, Staffing, and Attrition

AVS continues to recruit, hire and retain highly qualified safety professionals who have the necessary technical and analytical skills to meet the safety mission. AVS started FY 2019 with a staffing level of 7,092 and ended the fiscal year with a staffing level of 7,017. The FAA recognizes the ongoing challenge to identify and attract talent into key safety positions and we are pursuing a number of initiatives, activities and incentives to do so. The agency is taking steps, including recruitment incentives, to increase the number of qualified applicants to meet the need.

## Training and Succession Planning

AVS continues to hire safety professionals, providing appropriate training to take advantage of the workforce's diverse skill sets. By leveraging a combination of innovative Web-Based Training (WBT) and traditional classroom-based instruction, AVS prepares its workforce to meet the future demands of a dynamic aviation environment. Additionally, we are targeting personnel with expertise in human factors, systems safety engineering, software engineering, manufacturing and industrial engineering, data analytics and science, and international safety standards. AVS remains focused on building and maintaining a pipeline of skilled employees who are prepared to take on increasing responsibility within the organization. AVS tends to hire people later in their career. Due to this, mission-critical occupations, such as Aviation Safety Inspectors (ASI) and Aviation Safety Engineers (ASE), have the highest average workforce age and lowest average tenure, which reflects the hiring of experienced employees from industry.

# 2019 AVIATION ENVIRONMENT

**6,718**
Companies with Drug Testing Programs

**5,392**
Operator Certificates

**852,414**
Active Pilots (Includes UAS)

**6,856**
Air Agency Certificates

**716,010**
Non-Pilot Personnel

**383,101**
Airmen Medical Examinations

**284,865**
Registered Manned Aircraft

**1,493,687**
Registered Unmanned Aircraft

**112,427**
Flight Instructors

**1,518**
Approved Manufacturers

**21,097**
Mechanics with Inspection Authority

**193**
Foreign Civil Aviation Authorities

# UNDERSTANDING THE AVS MISSION

## AVS MISSION

To provide the safest, most efficient aerospace system in the world through a data-driven, risked-based, systems approach for standards, certification and oversight.

**Figure 1 | AVS Safety Mission**

From design through operation, AVS ensures that every entity certified to operate within the NAS continues to meet required safety standards.



## Setting Standards

AVS creates and updates rules, regulations, policies and associated guidance materials that apply to people, organizations, and equipment operating within the nation's civil aviation system. AVS also develops aviation safety and certification standards and policies in collaboration with the aviation industry, other government agencies, international partners and Subject Matter Experts (SME) within other FAA lines of business.
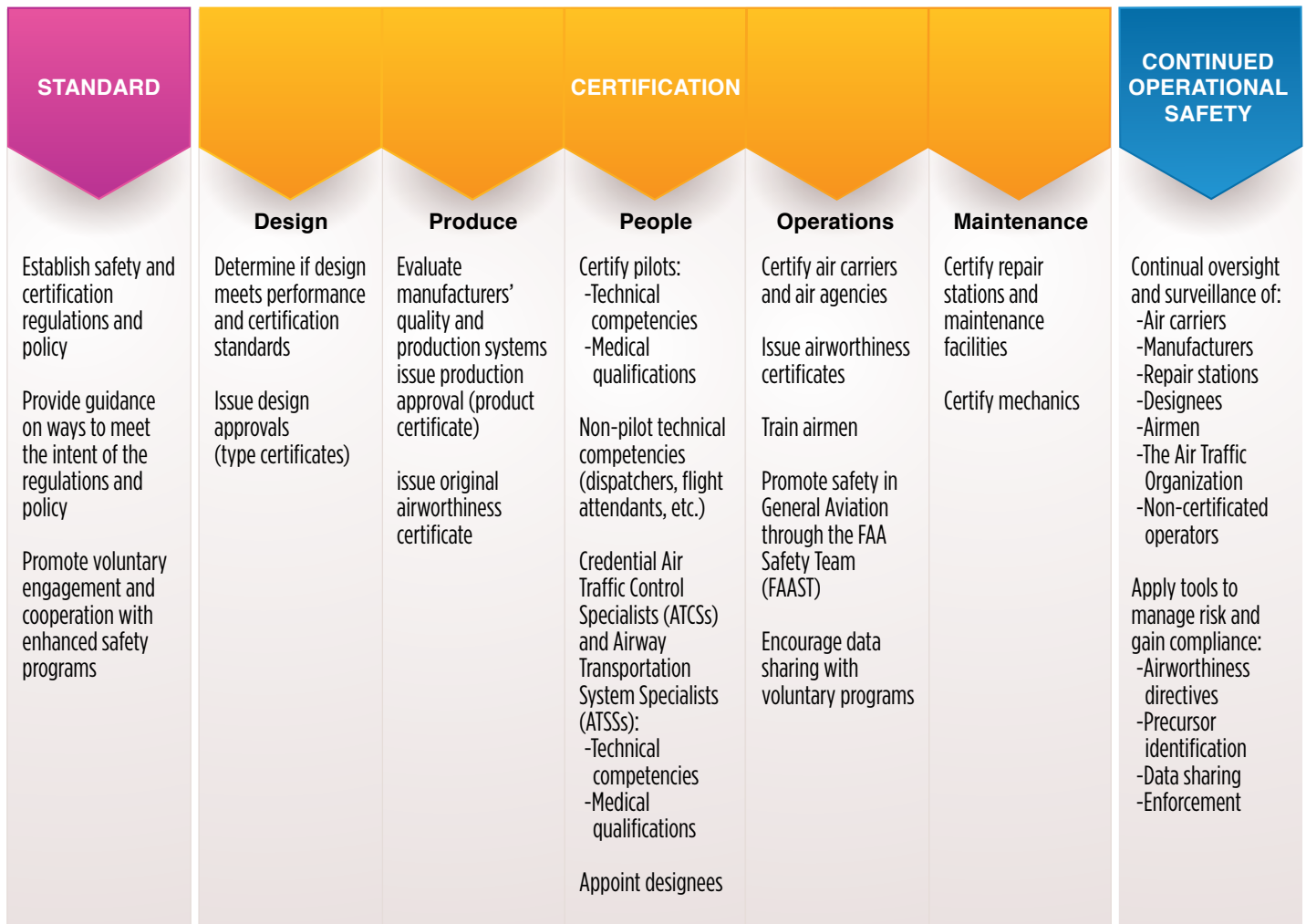
## Certification

AVS determines compliance with safety standards and issues certificates based on these standards. AVS issues both initial certificates and renewals to airmen, airlines, engineering and manufacturing organizations, aircraft owners, aircraft repair stations and repairmen, among others. AVS also issues airworthiness approvals for aircraft, engines and other aircraft parts.

## Continued Operational Safety

AVS ensures existing certificate holders and other regulated operators continue to meet the necessary safety requirements, standards and regulations through safety surveillance and oversight programs, audits, evaluations, education and training, research, and accident or incident investigations.

**Figure 2 | AVS Safety Lifecycle**

The AVS safety lifecycle encompasses the development of an aircraft, as well as introduction and operation of the aircraft in the NAS.

| STANDARD | CERTIFICATION | | | | | CONTINUED OPERATIONAL SAFETY |
| --- | --- | --- | --- | --- | --- | --- |
| | Design | Produce | People | Operations | Maintenance | |
| Establish safety and certification regulations and policy<br><br>Provide guidance on ways to meet the intent of the regulations and policy<br><br>Promote voluntary engagement and cooperation with enhanced safety programs | Determine if design meets performance and certification standards<br><br>Issue design approvals (type certificates) | Evaluate manufacturers' quality and production systems issue production approval (product certificate)<br><br>issue original airworthiness certificate | Certify pilots:<br>-Technical competencies<br>-Medical qualifications<br><br>Non-pilot technical competencies (dispatchers, flight attendants, etc.)<br><br>Credential Air Traffic Control Specialists (ATCSs) and Airway Transportation System Specialists (ATSSs):<br>-Technical competencies<br>-Medical qualifications<br><br>Appoint designees | Certify air carriers and air agencies<br><br>Issue airworthiness certificates<br><br>Train airmen<br><br>Promote safety in General Aviation through the FAA Safety Team (FAAST)<br><br>Encourage data sharing with voluntary programs | Certify repair stations and maintenance facilities<br><br>Certify mechanics | Continual oversight and surveillance of:<br>-Air carriers<br>-Manufacturers<br>-Repair stations<br>-Designees<br>-Airmen<br>-The Air Traffic Organization<br>-Non-certificated operators<br><br>Apply tools to manage risk and gain compliance:<br>-Airworthiness directives<br>-Precursor identification<br>-Data sharing<br>-Enforcement |

# COMPLIANCE PROGRAM

## Overview

Order 8000.373A, Federal Aviation Administration Compliance Program, sets forth the overarching guidance for implementing the FAA's strategic safety oversight approach. The Order clarifies and reinforces the law and agency policy that provides for FAA program offices to take the most appropriate action to resolve deviations in the NAS.

The Compliance Program is routinely applied to all interactions with airmen, certificated entities, non-certificated persons, and all investigatory processes. At a minimum, we expect compliance with the rules (established risk controls) from certificate holders. Our shared safety duties and responsibilities with NAS participants are about identifying hazards and risks, whether or not there are deviations from the regulations, and using the most effective means to return the person or entity to full compliance. We also look to prevent recurrence in order to achieve the highest degree of safety.

## Background

Initially referred to as the Compliance Philosophy, the Compliance Program represents a focus on using Compliance Action, where appropriate. Compliance Action describes the FAA's non-enforcement methods for correcting unintentional deviations or noncompliance resulting from factors such as flawed systems and procedures, simple mistakes, lack of understanding, or diminished skills.

In accordance with FAA strategic initiatives, the Compliance Program allows the FAA to move to an oversight approach that proactively manages risks globally through the identification and control of existing or emerging safety issues. It allows the FAA to concentrate resources on risk identification and problem-solving. The Compliance Program order also establishes a framework that enables the FAA to place more emphasis on effective compliance—how certificate holders ensure compliance rather than just a simple determination of whether they comply.

The Compliance Program promotes safety management principles to address safety risks by using consistent, data-informed approaches to make system-level, risk-based decisions. To foster an open and transparent exchange of information, the FAA believes that the Compliance Program, supported by an established safety culture, is instrumental in ensuring compliance with regulations, identification of hazards and management of risks. The program does not remove the FAA's option for enforcement in cases of repeated, intentional or reckless deviation from standards or laws, or violations that result in an unacceptable risk to safety.

## Results

The Compliance Program has improved our communication with certificate holders and other regulated operators. Since implementation of the Compliance Program, overall voluntary reporting has increased as more people are taking action on their own to address safety deficiencies. Over 25,000 safety issues were addressed using non-enforcement Compliance Actions to address regulatory deviations and improve the safety of the NAS. The non-enforcement and enforcement cases are worked more efficiently through the Compliance Program.

## MEETING THE CHALLENGE THROUGH FAA SAFETY MANAGEMENT

To reach the next level of safety in an increasingly complex and global air transportation environment, the FAA has instituted a proactive safety management approach. This approach incorporates safety considerations into the outcomes of any management or system activity. We have implemented this approach through the United States State Safety Program (SSP), enabled by the FAA SMS, both of which are consistent with the International Civil Aviation Organization (ICAO) SSP and SMS frameworks.

Through the Risk-Based Decision Making Strategic Initiative conducted from FY 2014 through FY 2018, we instituted a decision-making approach within our SMS that improves how we make decisions based on safety risk. A detailed analysis of the Initiative facilitated our efforts to set up the tools and processes that enable the gathering and sharing of data with those who can benefit and the structure for using that data to make risk-based decisions. We now leverage consistent, data-informed approaches to make smarter, system-level, risk-based decisions. The SMS further provides the structure to manage those decisions.

Aircraft Certification Service (AIR) incorporates risk-based decision making into its core functions of FAA involvement. AIR bases its risk-based decision making on risk to the aircraft certification safety system. An example of this is a new policy to reduce costs and streamline the installation of Non-Required Safety Enhancing Equipment (NORSEE) in General Aviation aircraft. AIR uses past performance and overall safety risk to manage resources and determine the frequency of surveillance on aviation manufacturers based on real-time data, as well as the Monitor Safety/Analyze Data process to promote data-driven risk assurance for the continued operational safety of products throughout their life cycle.

### Safety Management System

SMS is the formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk controls. It includes systematic procedures, practices and policies for the management of safety risk. Through an SMS, every process, decision, activity, acquisition, procedural change or program modification is examined from a safety risk perspective. Potential associated hazards are uncovered, examined and mitigated. It includes agency-wide safety policies, formal methods for identifying hazards, processes for continually assessing and controlling risk and safety performance, and the promotion of a safety culture.

Specifically, SMS consists of four main components: Safety Policy, Safety Risk Management, Safety Assurance, and Safety Promotion. These components work together to enable AVS to manage safety risk in the aerospace system.

  • **Safety Policy** – The organization's documented commitment to safety, which defines its safety objectives and the accountabilities and responsibilities of its employees in regard to safety. The Safety Policy places safety accountability at the top levels of the organization.

  • **Safety Risk Management (SRM)** – A process within the SMS composed of describing the system; identifying the hazards; and analyzing, assessing, and controlling risk.

• **Safety Assurance** – Processes within the SMS that function systematically to ensure the performance and effectiveness of safety risk controls and that the organization meets or exceeds safety objectives through the collection, analysis and assessment of information.

• **Safety Promotion** – The establishment and maintenance of a positive safety culture within an organization, the organization's safety training programs and the means to communicate regarding safety.

An SMS builds on existing processes, procedures and tools, enabling integration and interoperability across FAA Lines of Business (LOB), Staff Offices (SO) and AVS Services and Offices. It also allows for the introduction of new capabilities to meet the requirements in the current version of FAA Order 8000.369B, FAA Safety Management System, and FAA Order VS 8000.367, Aviation Safety (AVS) Safety Management System Requirements.

## Safety Management System Tools

AVS must develop and implement advanced tools and techniques to assess and mitigate aviation risks within a changing environment. AVS and aviation industry organizations are currently using or implementing several technological capabilities developed to manage safety risk.

• **Hazard Identification, Risk Management and Tracking (HIRMT)** is an FAA-wide, web-based tool designed to capture, manage and report on safety issues affecting multiple LOBs and SOs. The HIRMT tool facilitates consistent use of prescribed safety risk management and safety assurance processes, brings visibility to complex safety issues across multiple organizations' areas of responsibility, and tracks the status of hazard analysis and risk management efforts to provide an overall view of FAA and organizational safety portfolios.

• **Regulation and Certification Infrastructure for System Safety (RCISS)** provides hardware and software capability for safety applications throughout AVS. These applications assist in prioritizing AVS resources based on changing workload demands.

• The **Safety Assurance System (SAS)** is the FAA's oversight tool that performs certification, surveillance and Continued Operational Safety (COS). Oversight is an FAA function that assures the highest level of safety in the NAS by verifying that the aviation organizations or designees comply with and use safety-related standards, regulations and associated procedures. SAS includes policy, processes and associated software that FAA Flight Standards (AFS) uses during oversight to capture data. SAS was developed to satisfy the Safety Assurance component of AFS's internal SMS and is not a separate safety standard. SAS supports a new, proactive systems safety approach that will significantly improve the FAA's ability to identify and address hazards and safety risks before they result in accidents. The SAS oversight system was designed, developed, and implemented under the System Approach for Safety Oversight (SASO) Program and is constantly evolving and improving. The SASO Program Office continually automates and standardizes the FAA's safety oversight and inspection processes by implementing the ICAO SMS.

• The **Aviation Safety Information Analysis and Sharing (ASIAS)** program connects a wide variety of safety data and information sources across industry and government, including voluntarily-provided safety data. ASIAS partners with the Commercial Aviation Safety Team (CAST) and the General Aviation Joint Steering Committee (GAJSC) to monitor known risks, evaluate the effectiveness of deployed mitigations and detect emerging hazards.

• The **Monitor Safety/Analyze Data (MSAD)** process and IT tools are used by AIR to analyze event-based safety data, identify the appropriate response to significant events in support of continued operational safety and detect trends that could influence future events. The MSAD process helps identify safety issues for in-service aircraft fleets and identify corrective actions to mitigate safety risks across the fleet. The process uses product-defined hazard criteria to pinpoint potential hazards from pools of safety data. With MSAD, AIR can better identify emerging safety trends through dependent variable analysis. In addition, MSAD establishes a causal analysis approach to identify the underlying contributing factors of significant events, such as process breakdowns, which are then communicated to the appropriate AVS oversight business process owner.

• The **Risk-Based Resource Targeting (RBRT)** process and IT tools are used by AIR to assess risk and identify risk management options in order to establish work priorities and allocate resources. It is a sub-process used in other AIR business processes, such as type and production certification, certificate management and designee management. This process establishes risk thresholds that provide a consistent approach for AIR involvement and prioritization of decisions. It allows AIR to manage resources with a consistent understanding of the risks based on real-time data. Additionally, the Flight Standards SAS automation provides AIR management with RBRT tools that assist them in decisions on effectively focusing resources.

• The **Aerospace Medicine Safety Information System (AMSIS)** will provide the Office of Aerospace Medicine (AAM) with a state-of-the-art aerospace medical information system, integrating critical data from a variety of national and international locations. The program will deliver re-engineered AAM safety program business processes with the FAA's cloud-based enterprise information system. It will automate the entire workflow for several of the current Medical Information systems, and it will also enable AAM to analyze information and make risk-based decisions through improved collection, review, and analyses of medical information. The system will support timely and comprehensive access to data by reducing delays, thereby improving timeliness and accuracy while eliminating paper-based correspondence. AMSIS Phase 1 includes Drug Abatement, Covered Position Medical Clearance, and Airman Medical Certification. Initial Operational Capability is targeted for deployment in late 2021, with Full Operational Capability projected for 2023.

• The **Systems Safety Management Transformation (SSMT)** enables safety assessments of proposed NextGen concepts, algorithms and technologies that address the economic, implementation, operational and performance impacts of NextGen alternatives. The program will develop a working prototype of a National Level Safety Assessment within the Integrated Safety Assessment Model (ISAM). It will link the Airport Surface Anomaly Investigation Capability (ASAIC) anomaly detection tool and accident DNA from National Transportation Safety Board (NTSB) reports to proactively identify emerging risks associated with NAS-wide operations. Hazard identification and tracking systems developed within the FAA will be linked to the ISAM to support operational safety analyses. Mechanisms to define and support integrated risk-based approaches to safety and safety oversight will be prototyped to monitor operational safety and determine safety implications to the air transportation system of operational changes primarily driven by NextGen.

## 737 MAX

The grounding of the Boeing 737 MAX placed a spotlight on safety, and the FAA is considering a number of recommendations from expert panels as we build the workforce of the future. For the MAX, as with all aircraft, we made use of a thorough certification process that has consistently produced safe aviation products.

The expert reviews of the 737 MAX certification and the FAA's internal analysis have highlighted a need to enhance the FAA's oversight of the aircraft certification process and continue to foster the FAA's workforce, particularly human factors technical specialists. Advancements in aircraft automation have contributed to an unprecedented level of safety in our domestic aviation system. However, those advancements reaffirm the importance of considering human factors and the interface between aircraft pilots and systems during certification. The FAA is committed to considering improvements to regulations and policies as they relate to flight crew training and operational suitability of aircraft design.

This moves us toward an integrated approach to aircraft certification that brings with it a higher level of safety. The FAA is cognizant that enhancing our current and future AIR and AFS workforce will require investment, which is reflected in the President's budget for fiscal year 2021.

## ORGANIZATION DESIGNATION AUTHORIZATION OFFICE

The use of delegation has long been a key part of the FAA's safety system. Organization Designation Authorization (ODA) is a form of delegation. The FAA grants ODA authority based on the needs of the agency. The FAA may issue an ODA once it determines that a company or organization meets stringent eligibility requirements, including professional integrity, technical competency and a history of compliance assurance.

As part of our delegation oversight program, we conduct supervision and inspection. In addition to our review of audits and an annual assessment, the FAA conducts an on-site detailed inspection every two years to ensure compliance. Substandard performance can result in increased FAA involvement, suspension or termination of ODA granted by the FAA.

The FAA Reauthorization Act of 2018 [Sec. 212(b)] mandates establishment of a centralized office to be known as the Organization Designation Authorization Office, within AVS. Among other functions, this office will oversee and ensure the consistency of the FAA's audit functions under the ODA program across the FAA. The FAA's FY 2021 Budget Request establishes a new ODA Office, which will be responsible for providing guidance and promoting standardization and enhanced coordination for all AVS ODA holder activities.

The new AVS ODA Office is another progression in the FAA's continuous improvement process. In addition to ensuring a cross-organizational focus on oversight, this office will further facilitate decision-making based on issues that pose the highest risks to safety.
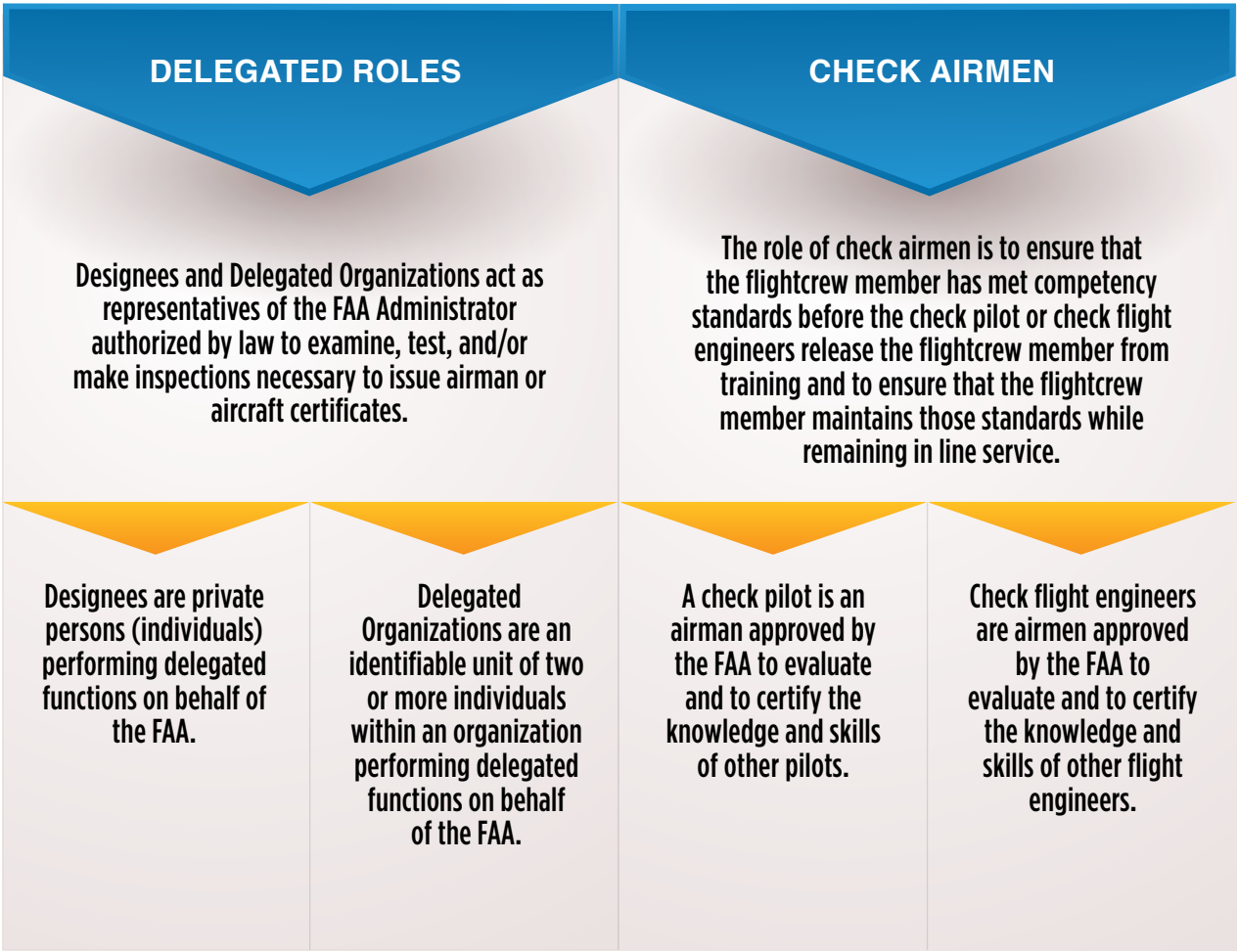
## DESIGNEES, DELEGATED PROGRAMS AND CHECK AIRMEN

Designees and delegated organizations are the private persons and organizations to which AVS assigns the authority of performing functions on behalf of the Administrator under 49 USC 44702(d) and Title 14 of the Code of Regulations (14 CFR) Part 183. Risk management, designees and delegated organizations help the FAA meet the needs of the aviation industry and better leverage federal resources to focus on efforts that cannot be delegated.

Check airmen are pilots or flight engineers who are qualified and permitted to conduct flight checks or instruction in an airplane, flight simulator, and/or a flight training device for a particular type of airplane under an approved air carrier training program. The role of the check airman is to ensure that a flight crew member has met competency standards before the check airman releases the flight crew member from training and to ensure the flight crew member maintains those standards while remaining in line service. Because check airmen do not conduct flight tests to issue airman certificates, they are not considered designees as defined in 14 CFR Part 183.

**Figure 3 | Delegated Roles and Check Airmen**

Figure 3 explains the functions performed by designees and delegated organizations on behalf of the FAA and the functions performed by check airmen under the certificate authority of their employer.

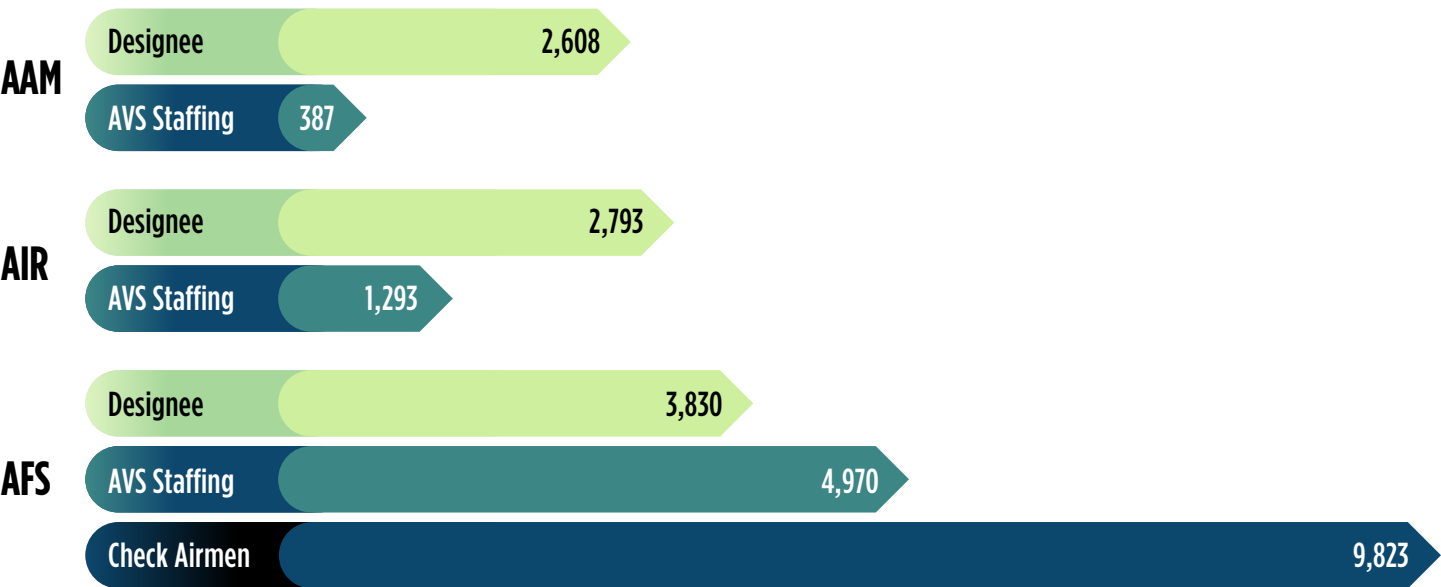| DELEGATED ROLES | | CHECK AIRMEN | |
|---|---|---|---|
| Designees and Delegated Organizations act as representatives of the FAA Administrator authorized by law to examine, test, and/or make inspections necessary to issue airman or aircraft certificates. | | The role of check airmen is to ensure that the flightcrew member has met competency standards before the check pilot or check flight engineers release the flightcrew member from training and to ensure that the flightcrew member maintains those standards while remaining in line service. | |
| Designees are private persons (individuals) performing delegated functions on behalf of the FAA. | Delegated Organizations are an identifiable unit of two or more individuals within an organization performing delegated functions on behalf of the FAA. | A check pilot is an airman approved by the FAA to evaluate and to certify the knowledge and skills of other pilots. | Check flight engineers are airmen approved by the FAA to evaluate and to certify the knowledge and skills of other flight engineers. |

AFS, AIR and AAM combined oversee over 8,800 designees. It is important for the FAA to have the data, evaluative processes and a well-trained staff to monitor the designee program effectively. This ensures that goals are met and a positive impact on safety and efficiency is attained.

**Figure 4: Leveraging Delegation**

Figure 4 illustrates the degree to which AFS, AIR and AAM rely on individual designees and check airmen to augment oversight capabilities. The graphic does not include other AVS Services and Offices as they do not have an individual designee or check airmen component.
(Data as of pay period 20, 2019.)

**AAM**
- Designee: 2,608
- AVS Staffing: 387

**AIR**
- Designee: 2,793
- AVS Staffing: 1,293

**AFS**
- Designee: 3,830
- AVS Staffing: 4,970
- Check Airmen: 9,823

# FUTURE OF FLIGHT STANDARDS

To effectively implement risk-based decision making in the oversight of a highly dynamic industry, AFS is evolving into a more agile, effective and consistent organization. It will need to operate with greater accountability and change readiness, as well as a better use of resources. This requires both cultural and structural changes.

AFS has completed the major part of transitioning from a geography-based structure to a functional-based structure. This shift advances the core attributes of interdependence, critical thinking and consistency that have been embedded in each employee's work requirements. AFS adopted a proactive approach to transforming the workforce during the transition from a traditional oversight to a post-Compliance Program landscape that places great value on voluntarily shared safety data.

The realigned organizational structure makes inconsistencies and inefficiencies more visible to management. As opportunities are identified, we expect to leverage resources between office locations more effectively, change our processes to be more efficient, and use a larger set of data to target our activities toward those areas of the aviation system with the highest risk. These changes will impact our future workforce requirements as we become more agile in our recruitment methodology and will help us meet our need for additional safety experts in emerging areas of activity, such as operations research analysts.

AFS will continue to evolve in multiple phases over the next year to ensure continuity of operations. These changes will enable AFS to further align its internal structure and responsibilities and streamline programs to create efficiencies, reduce waste and improve aviation safety.

# AIRCRAFT CERTIFICATION SERVICE TRANSFORMATION

AIR Transformation is a comprehensive approach to improving safety, efficiency and effectiveness.

As a major step toward AIR Transformation, in July 2017, the Service reorganized from a product-based structure to a functionally-aligned organization. This phase involved aligning into functional divisions AIR's existing local offices, such as Aircraft Certification Offices, Standards Staffs, Technical and Administrative Support Offices, Manufacturing Inspection Offices and Manufacturing Inspection District Offices. To increase awareness, AIR published a Blueprint for AIR Transformation in March 2017, which contained the vision and high-level strategy.

In 2018, AIR continued significant efforts toward AIR Transformation with the development and publication of the first edition of AIR's Comprehensive Strategic Plan (CSP). The CSP translates the Blueprint for AIR Transformation into a broad set of initiatives that seek to better manage operational safety risk, reduce time for approval decisions, increase schedule predictability and increase our productivity. In the future, AIR will operate under a systems approach that considers how decisions and information across the product lifecycle affect safety risks.

In 2019 (and continuing into 2020), AIR has worked on the Refinement phase of the reorganization, which includes detailed designs for, and permanent placement of, staff in each functional division. AIR also continues to work with internal and external stakeholders on collaboration and engagement. AIR is acting on a number of recommendations received from the Safety Oversight and Certification Aviation Rulemaking Committee as well as Congressional requirements from the 2018 FAA Reauthorization and inputs from the AVS Strategic Plan. AIR recognizes that it is critical to respond to our changing environment, and AIR will maintain its commitment to the CSP by working on a portfolio of strategic projects addressing recommendations to enhance the certification process and focusing on continual improvement.

# UNMANNED AIRCRAFT SYSTEMS

Unmanned Aircraft Systems (UAS) operations are quickly increasing in number, technical complexity, and sophistication. UAS are spurring one of the most dynamic periods of change in the history of transportation; the growth in popularity of UAS also presents a number of challenges. In order to facilitate the safe and efficient integration of UAS into the NAS, the FAA established the UAS Integration Office (AUS) in December 2016. AVS has identified activities the FAA will perform over the next five years to enable a risk-based regulatory framework supporting the integration of UAS into the NAS. The FAA collaborates with a full spectrum of stakeholders, including:

- Manufacturers
- Commercial vendors
- Industry trade associations
- Law enforcement and first responder agencies
- Technical standards organizations
- Academic institutions
- Research and development centers
- Federal, state, local and tribal governments or other regulators

The process of developing regulations is resource intensive. To establish an appropriate UAS oversight framework, the FAA will continue to develop, review and revise policies, guidance and rules to specifically address safe and efficient UAS integration and evolution within the NAS.

As of October 2019, AUS:

- Stood up the Unmanned Aircraft Safety Team (UAST)
- Held four annual UAS Symposiums
- Stood up the Drone Advisory Committee (DAC)
- Established nine ongoing Integration Pilot Program (IPP) agreements
- Increased outreach and improved stakeholder relationships through the publishing of multiple drone safety videos and webinars on UAS Safety, community meetings in partnership with the IPP program, events such as the UAS Symposium, hosting the UAS-Unmanned Aircraft Traffic System Management (UTM) summit and executing the first annual Drone Safety Awareness Week
- Worked with Flight Standards to complete the following:
  - Approved 3,367 Non-Airspace Waivers under 14 CFR Part 107
  - Issued 157,062 Remote Pilot Certificates
  - Processed 1,493,687 UAS Registrations

In addition, zero fatalities or serious injuries related to UAS operations were reported in the first two years since the Small UAS Rule (14 CFR Part 107) took effect. In FY 2020 and beyond, AUS will coordinate FAA UAS initiatives with national security agencies to address security concerns. AUS will also work with the FAA's Law Enforcement Assistance Program to provide outreach and educational support to law enforcement organizations. These efforts will ensure law enforcement knows what to do and which laws pertain to UAS within their jurisdictions. These are important steps as the FAA continues developing UAS regulations in order to safely integrate UAS into the NAS.

In October 2017, the President of the United States issued a memorandum to the Secretary of Transportation to establish a UAS Integration Pilot Program. IPP Lead Participants are evaluating a host of operational concepts, including night operations, flights over people and beyond the pilot's line of sight, package delivery, detect-and-avoid technologies and the reliability and security of data links between pilot and aircraft. Fields that could see immediate opportunities from the program include commerce, photography, emergency management, agricultural support and infrastructure inspections. The program will expire in October, 2020.

The FAA has seen the IPP lead the way in establishing new procedures and advancing operations that enable the safe integration of UAS into the NAS, including the establishment of the first two commercial operating certificates (part 135) for package delivery unmanned operators.

# UNDERSTANDING THE AVS WORKFORCE

## STAFFING CATEGORIES

The AVS workforce is comprised of three staffing categories, each with its own distinct set of responsibilities.

### Safety Critical Operational Staff

Safety Critical Operational Staff have a direct operational impact on the AVS safety mission. Their responsibilities include, but are not limited to:

• Monitoring and enforcing industry compliance with safety regulations through inspections, data analysis and risk management
• Certifying aviation personnel, airlines, repair stations, training centers and other aviation agencies
• Monitoring and enforcing Air Traffic Organization (ATO) compliance with safety standards
• Certifying aircraft alterations, equipment and avionics
• Overseeing and monitoring AVS designee programs
• Monitoring and enforcing industry drug and alcohol testing programs
• Investigating accidents and incidents
• Overseeing and monitoring UAS integration into the NAS

### Safety Technical Specialist Staff

Safety Technical Specialist Staff provide the necessary support for Safety Critical Operational Staff to do their jobs efficiently and effectively. These responsibilities include, but are not limited to:

• Evaluating and analyzing the effectiveness of existing AVS certification, regulatory and compliance programs
• Developing new programs, activities and methods for improved oversight activities and enhanced industry safety
• Implementing new programs and revised approaches as directed by Congress, the Government Accountability Office (GAO), the U.S. Department of Transportation Office of the Inspector General (OIG), the NTSB and other oversight organizations
• Designing, developing and delivering technical training curricula
• Maintaining airmen and aircraft registries and the airmen medical certification system
• Guiding development and publication of FAA rules and regulations through the rulemaking process

### Operational Support Staff

Operational Support Staff consist of all AVS personnel in functions that are not classified as Safety Critical Operational Staff or Safety Technical Specialist Staff. These individuals perform functions such as management, supervision, resource planning and project administration.

# AVS SERVICES AND OFFICES

AVS serves the aviation community by promoting safety and providing a breadth of services. The AVS workforce includes eight services and offices located domestically and abroad. The population distribution charts represent the FY 2019 workforce.
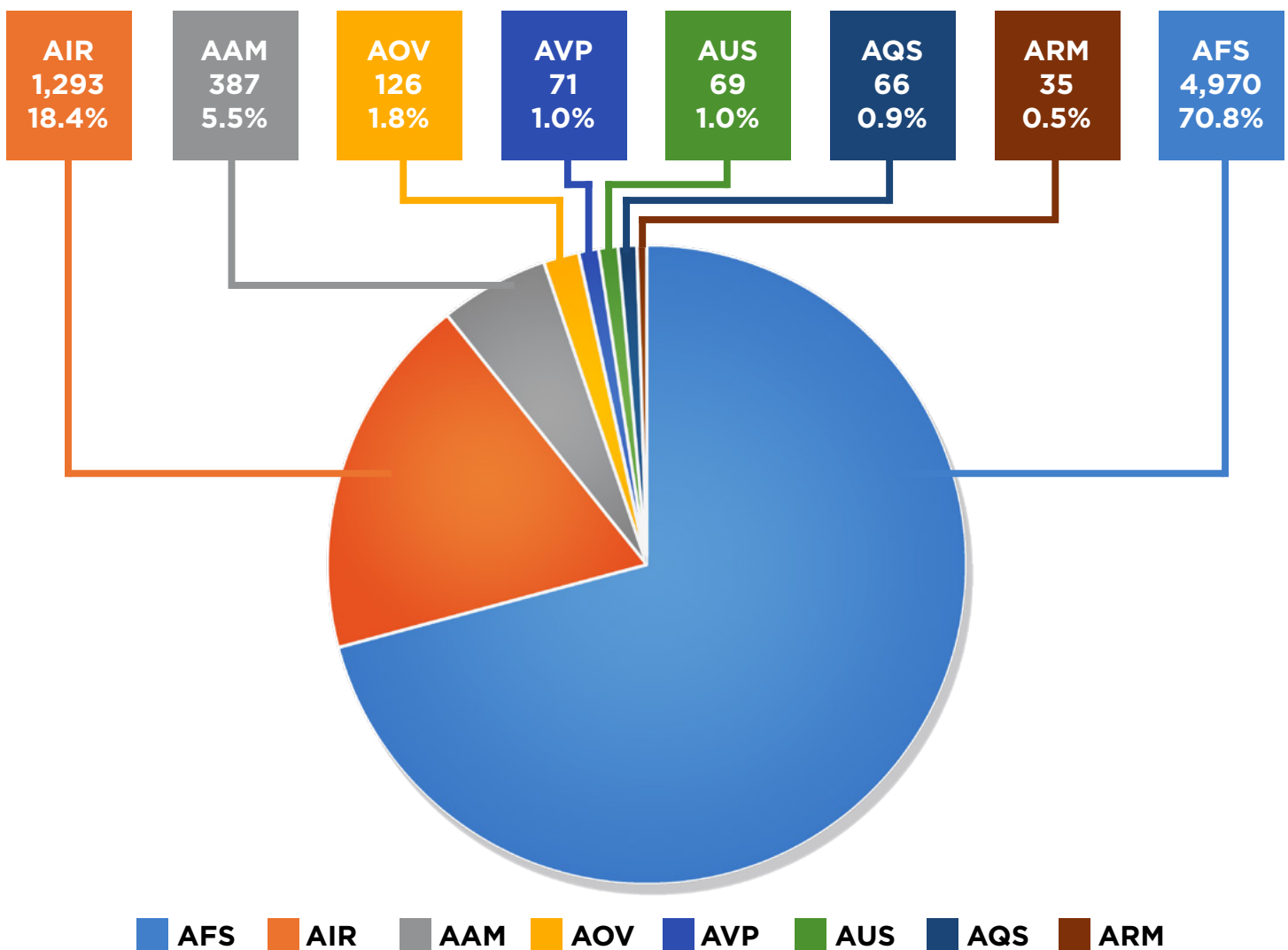
## Services

- Flight Standards (AFS)
- Aircraft Certification (AIR)
- Air Traffic Safety Oversight (AOV)

## Offices

- Aerospace Medicine (AAM)
- Accident Investigation and Prevention (AVP)
- Rulemaking (ARM)
- Quality, Integration and Executive Services (AQS)
- Unmanned Aircraft Systems Integration (AUS)

**Figure 5 | AVS Population**

The composition of the Aviation Safety Workforce by Service and Office.



| AIR 1,293 18.4% | AAM 387 5.5% | AOV 126 1.8% | AVP 71 1.0% | AUS 69 1.0% | AQS 66 0.9% | ARM 35 0.5% | AFS 4,970 70.8% |

Legend: AFS · AIR · AAM · AOV · AVP · AUS · AQS · ARM

## Flight Standards 4,970 (as of PP 20 FY2019) (70.8%)

The Flight Standards Service promotes safety in air transportation by setting the standards for certification and oversight of airmen, air operators, air agencies and designees, as well as safe flight of civil aircraft in air commerce by:

- Setting regulations and standards that consider the air carrier's duty to operate in the public interest at the highest possible degree of safety
- Setting regulations and standards for other air commerce, air agencies and airmen at the appropriate level of safety to the public interest
- Certification, inspection, surveillance, investigation and enforcement activities
- Managing the registry system for civil aircraft and all official airmen records



Safety Critical 77%
Safety Technical 8%
Operational Support 15%
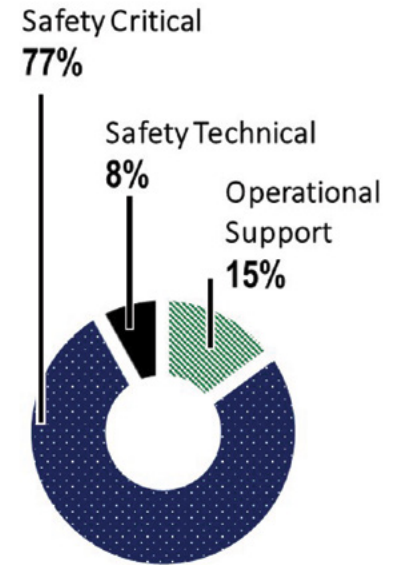
## Aircraft Certification 1,293 (18.4%)

The Aircraft Certification Service develops and administers safety standards governing the design, production and airworthiness of civil aeronautical products by:

- Overseeing design, production and airworthiness certification programs to ensure compliance with prescribed safety standards
- Establishing and maintaining a safety performance management system for continued operational safety of aircraft
- Providing oversight of approval holders, designees and delegated organizations
- Working with aviation authorities, manufacturers and other stakeholders to help them improve safety in the international air transportation system



Safety Critical 73%
Safety Technical 17%
Operational Support 10%
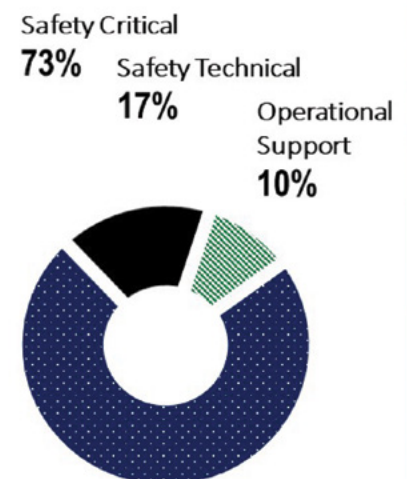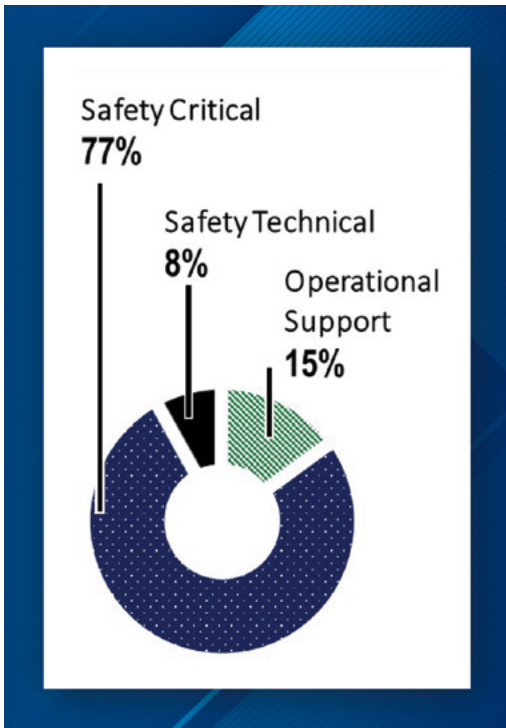
### Aerospace Medicine 387 (5.5%)

The Office of Aerospace Medicine is responsible for a broad range of medical programs and services for both the domestic and international aviation communities. AAM provides global leadership for aerospace medicine in the 21st century by:

- Providing aerospace medical education
- Conducting and providing aerospace medical and human factors research
- Establishing and overseeing aviation industry drug and alcohol testing
- Providing the employee health awareness program
- Providing FAA employee drug and alcohol testing
- Conducting and determining medical clearance of air traffic control specialists and other FAA employees required to meet medical standards to perform safety- sensitive duties
- Providing Occupational Health
- Establishing and determining pilot medical certification

**Safety Critical 77%**
**Safety Technical 8%**
**Operational Support 15%**
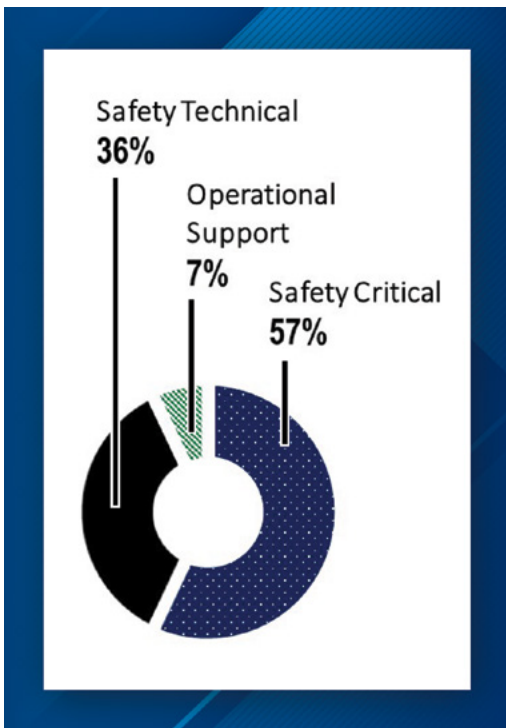
### Air Traffic Safety Oversight 126 (1.8%)

The Air Traffic Safety Oversight Service is responsible for the independent safety oversight of the ATO's provision of air traffic services. AOV's safety oversight follows a system safety approach to the operations of the ATO by:

- Establishing, approving or accepting safety standards
- Approving any changes to the SMS Manual
- Monitoring ATO compliance with safety standards and the SMS
- Establishing, implementing and maintaining a Credentialing Program to issue, amend, and remove credentials of ATO, Department of Defense, National Geospatial-Intelligence Agency and Aeronautical Information Services personnel
- Approving controls associated with initial or current high-risk hazards, changes that pertain to separation minima and the NAS equipment availability program
- Reviewing proposed responses to safety recommendations from the NTSB, OIG or GAO involving the ATO

**Safety Technical 36%**
**Operational Support 7%**
**Safety Critical 57%**

## Accident Investigation and Prevention 71 (1.0%)

The Office of Accident Investigation and Prevention's overall mission is to make air travel safer through accident and incident investigation, data collection, risk analysis and information sharing by:

- Investigating major or significant accidents and incidents to identify safety deficiencies and unsafe conditions and trends and to recommend policy
- Addressing NTSB and internal FAA safety recommendations
- Directing ASIAS initiatives, conducting data analyses and creating an environment to share safety information with government and industry to enhance safety
- Overseeing the AVS R&D portfolio
- Managing the US SSP, FAA SMS and AVS SMS.
- Coordinating the collaborative efforts of the government and industry safety teams—CAST and GAJSC



Safety Technical 70%
Operational Support 17%
Safety Critical 13%
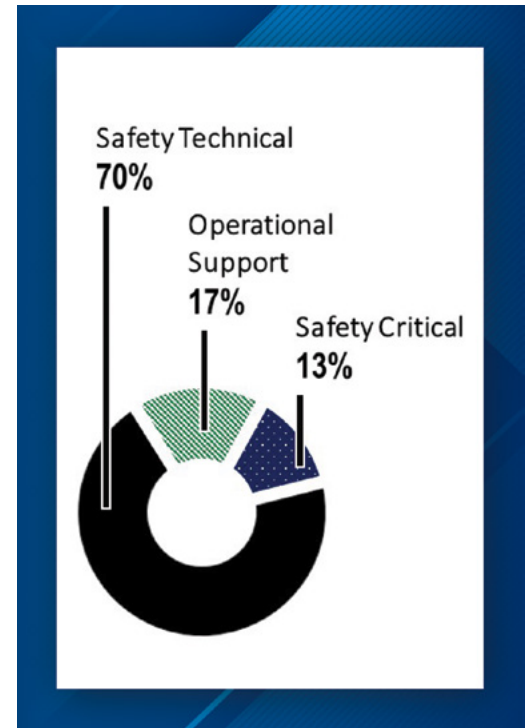
## Unmanned Aircraft Systems Integration 69 (1.0%)

The Unmanned Aircraft Systems Integration Office is responsible for facilitating the safe, efficient and timely integration of UAS into the NAS by:

- Managing and coordinating international UAS activities for AVS and ensuring alignment of these activities with United States and FAA strategy
- Developing strategic planning goals and providing direct support for UAS R&D
- Providing project management and data support for all UAS integration-related programs and activities
- Supporting standards and policy developments related to UAS integration and providing engineering resources to support UAS projects
- Ensuring consistency of messaging and public outreach tools for all UAS-related communications materials
- Coordinating operational aspects of safe and timely integration of UAS into the NAS
- Working with industry stakeholders to ensure FAA strategic goals align with industry objectives and resources
- Facilitating cross-governmental coordination of efforts on UAS integration across FAA LOBs and SOs



Safety Technical 56%
Operational Support 25%
Safety Critical 19%
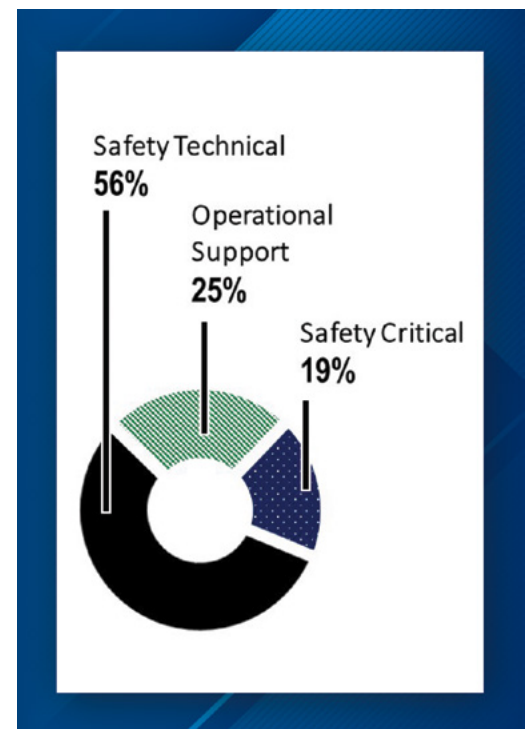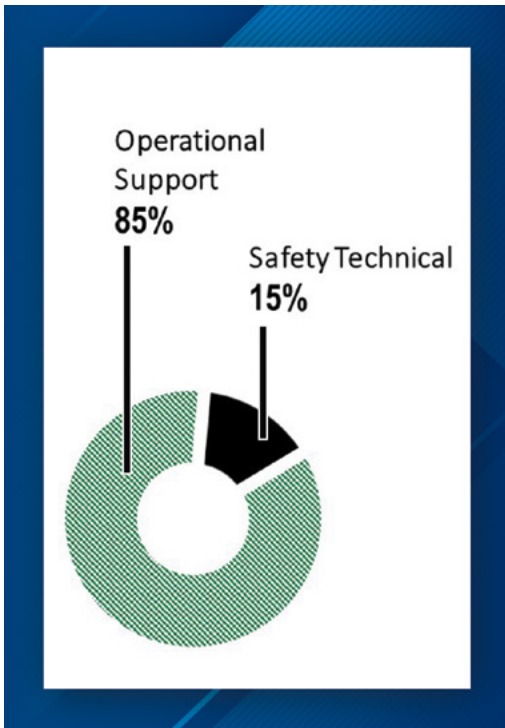
## Quality, Integration & Executive Services 66 (.9%)

The Office of Quality, Integration & Executive Services provides executive oversight and consolidated management support services for all of AVS. AQS manages all phases of administrative activities for the immediate Office of the Associate Administrator by:

- Approving, overseeing and facilitating integration initiatives among the AVS Services and Offices
- Overseeing the AVS Quality Management System
- Providing budget and labor distribution reporting management
- Providing planning and administrative management

Operational Support 85%
Safety Technical 15%
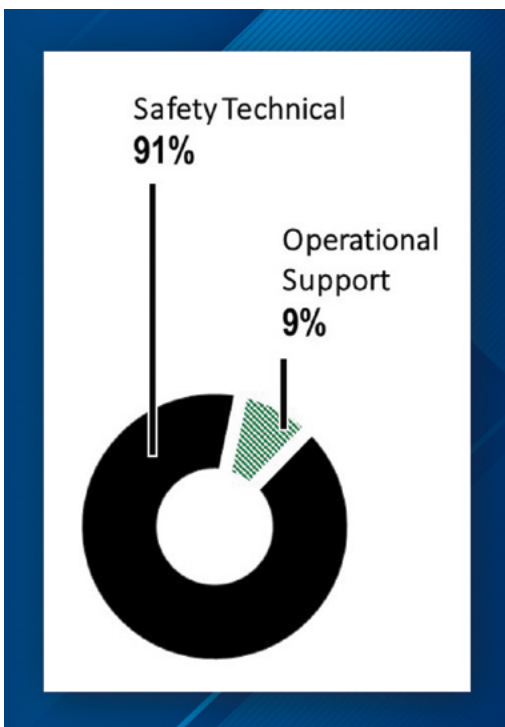
## Rulemaking 35 (.5%)

The Office of Rulemaking manages the FAA's rulemaking program, processes and timelines by:

- Developing proposed and final rules and managing responses to petitions for rulemaking
- Managing responses to petitions for exemption from regulatory requirements
- Overseeing aviation rulemaking and advisory committees that provide advice and recommendations on aviation and aerospace-related issues
- Leading, guiding, supporting and coordinating FAA cross-organizational strategies for aviation regulations
- Coordinating with international partners

Safety Technical 91%
Operational Support 9%

# AVIATION SAFETY INSPECTORS AND AVIATION SAFETY ENGINEERS

AFS and AIR are the two largest entities within AVS, representing 89 percent of positions. The two largest occupational series, ASIs and ASEs, make up 76 percent of the personnel within AFS and AIR. These positions comprise over two-thirds of all positions within AVS.

## Aviation Safety Inspectors

ASIs are responsible for the certification and surveillance of air carriers, aircraft manufacturers and air operators in accordance with 14 CFR. ASIs reside within AFS and AIR, where their specific responsibilities are as follows:

**Flight Standards ASI responsibilities:**

- Working within the aviation community to promote safety and enforce FAA regulations
- Providing oversight of aircraft operators and maintainers, pilots, designees, flight attendants, dispatchers, flight and maintenance schools, and maintenance facilities
- Developing FAA rules, policies and guidance for operations, maintenance and avionics-related issues (ASI headquarters-level responsibility)

**Aircraft Certification ASI responsibilities:**

- Administering and enforcing safety regulations and standards governing the production, airworthiness and continued operational safety of aircraft, aircraft engines, propellers and other civil aeronautical products
- Providing oversight of approval holders, designees and delegated organizations
- Ensuring continued operational safety of aircraft

## Aviation Safety Engineers

ASEs apply advanced engineering knowledge and experience in specific engineering disciplines such as airframes, systems and equipment (electronics/avionics and electrical or mechanical), propulsion and flight tests. The majority of ASEs reside in AIR, and their responsibilities are as follows:

- Administering safety standards governing the design of aeronautical products
- Evaluating designs for compliance with safety regulations and standards
- Providing oversight of approval holders, designees and delegated organizations
- Ensuring continued operational safety of aircraft, engines and propellers

# FORECASTING AVS WORKFORCE NEEDS

Because the majority of positions within AVS are ASIs and ASEs, forecasting and modeling efforts have mostly concentrated on assessing the requirements for these positions. The AVS Staffing Tool and Reporting System (ASTARS) assists the FAA in identifying staffing requirements for ASIs, ASEs and Aerospace Medicine airman medical certification and Air Traffic Control Specialist (ATCS) medical clearance.

## AVS STAFFING TOOL AND REPORTING SYSTEM

Multiple distinct staffing models forecast workforce needs under ASTARS:

- Flight Standards District Offices and Certificate Management Offices
- Aircraft Evaluation Groups
- International Field Offices
- AIR Standards Management Team
- Manufacturing Inspection Offices and Manufacturing Inspection District Offices
- Aircraft Certification Offices
- Office of Aerospace Medicine airmen medical certification and ATCS medical clearance

### Historical Work Activities and Work Hours

The models all share the same general structure. Activities and work hours are classified and quantified by work type. The average time per activity, referred to as the nominal time, is calculated annually by using hours recorded in the Labor Distribution and Reporting (LDR) system and other appropriate oversight activity tracking systems.

### Forecasting

The number of activities forecasted for the next 10 years is based upon their relationship to demand drivers. Annual model improvement activities include analyzing and incorporating regression analysis to validate that a relationship exists between demand drivers and activities. Where possible and applicable, FAA-produced forecasts are used to predict workload change associated with industry growth. These forecasts are combined with field-level knowledge of expected workload changes.

The required workforce is then calculated by multiplying the nominal time per activity by the number of forecasted activities for each year for 10 years. The model determines the staffing levels that will be required if the same level of effort needed to support current activities is forecasted based upon the growth or contraction of the current industry. The model is adjusted to account for new industry efforts such as UAS and the implementation of new automation applications. We are currently examining the workload demand drivers and expect to incorporate them in the AVS out year staffing requirements next year.

## Calculation Review

All ASTARS models follow the same general development process that includes both historical data calculation and SME review. The nominal times and distributions are examined by a team of headquarters and field personnel for accuracy, trends and outliers. The ASTARS review team is a multidisciplinary group of model developers, such as operations research analysts, economists, industrial engineers and mathematicians. The team also includes field ASIs, ASEs, physicians, managers and policy makers charged with developing AVS work activities. The focus of the review is to research and identify workload information that is supported with data and field experience.

## Data Quality Improvements

AVS has applied significant effort in the last seven years on improving the data quality of workload and work-hour tracking systems. The improved data quality has allowed the ASTARS program to:

- Identify and review actual working time for various ASIs, ASEs and AAM certification or clearance activities
- Categorize and priority-rank work activities
- Identify and quantify the potential change in activities associated with staffing increases or shortfalls
- Examine the relationship between activity categories and industry growth
- Research training times for employees at different experience levels
- Compare workload recorded in various oversight applications (i.e. the Air Transportation Oversight System, the Program Tracking and Reporting Subsystem and the SAS)
- Examine the year-over-year change in time spent per activity and estimate future workload
- Examine workload differences between offices and identify potential causes (e.g. work type, company profile and travel times)
- Quantify and project all work hours, including those spent on training, administrative activities, leave and travel
- Examine the workload impact associated with designee oversight

As a result, the models are a more reliable source for data-informed decision making.
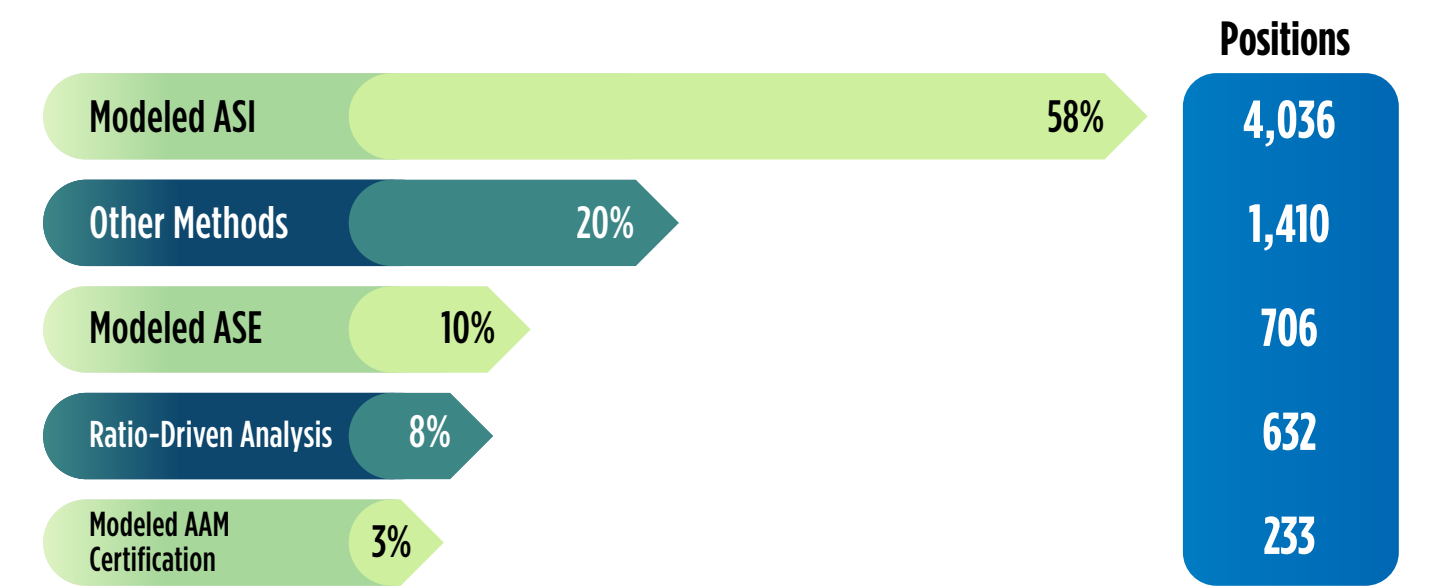
**Figure 6 | AVS Population**

The composition of the Aviation Safety Workforce by Service and Office.

| | |
|---|---|
| **NOV 2003** | Public law 108-76 commissioned a study by the National Academy of Sciences to address ASI staffing practices and allocation decisions. |
| **JUN 2004** | FAA contracted with the National Academy of Sciences. |
| **SEP 2006** | The National Academy of Sciences published a report on inspector staffing stating the then-current staffing model for AFS did not provide sufficient information on the number of staff required or where staff should be located. |
| **OCT 2009** | AVS concurred with the National Academy of Sciences recommendation by creating the Flight Standards ASI staffing model known as the AVS Staffing Tool and Reporting System (ASTARS). |
| **OCT 2012** | AIR ASI model implemented into ASTARS. |
| **JUN 2013** | OIG released a report entitled "FAA Lacks a Reliable Model for Determining the Number of Flight Standards Safety Inspectors it Needs" with results stating the current model was not meeting expectations or requirements. |
| **JUN 2013** | AVS met with the National Academy of Sciences in the first of two expert meetings to discuss the steps the FAA had taken to implement the recommendations in the 2007 National Resource Council (NRC) report on staffing standards for ASIs and to discuss possible additional implementation steps related to staffing for ASIs. |
| **SEP 2013** | The "ASTARS Gap Analysis" report was released with results stating that the current AFS model did not incorporate all National Academy of Sciences recommendations as required. |
| **MAR 2014** | AFS model improvements begun by the multidisciplinary project team. |
| **OCT 2014** | AIR ASE model implemented into ASTARS. |
| **SEP 2015** | AFS Aircraft Evaluation Group offices (AEG) and International Field Offices (IFO) implemented into ASTARS. |
| **OCT 2015** | AIR standards and policy (ASE/ASI) model implemented into ASTARS. |
| **OCT 2016** | All gaps identified in the "ASTARS Gap Analysis" report of 2013 have been closed with the exception of performance metrics, which will require continuous improvement. |
| **OCT 2017** | Aerospace Medicine (AAM) model for Airmen and Air Traffic Certification was implemented into ASTARS. |
| **FEB 2020** | AFS model enhancements are in process based on the new Functional Office Structure. |

**Figure 7 | Methods for Forecasting Positions within AVS**

Figure 7 identifies methods used to forecast staffing within AVS. Information shown represents actual positions at the end of FY 2019.



| Method | Percentage | Positions |
| --- | --- | --- |
| Modeled ASI | 58% | 4,036 |
| Other Methods | 20% | 1,410 |
| Modeled ASE | 10% | 706 |
| Ratio-Driven Analysis | 8% | 632 |
| Modeled AAM Certification | 3% | 233 |

## Ratio Methodology Used for Safety Technical Specialist and Operational Support Staff

For both AIR and AFS, the Safety Technical Specialist Staff and Operational Support Staff are forecasted using historic staffing ratios that compare managers and administrative support personnel to Safety Critical Operational Staff requirements. Safety Technical Specialist and Operational Support positions are projected to grow based on historical ratios to the ASI and ASE positions.

Figure 7 shows which positions are determined by ASTARS, which are ratio-driven based upon ASTARS outputs, and which are forecasted outside of the ASTARS process. Forecasts of ASI, ASE and AAM Certification positions (4,975) are generated by the ASTARS staffing models and comprise 71 percent of all AVS staffing. An additional 632 positions are Safety Critical Operational Staff, derived as a ratio of the ASTARS forecasts. The remaining 1,410 positions are determined independently of the ASTARS model. The FAA continues to work to incorporate other workforces into data-driven models.

## Managerial Input

The ASTARS model is not the sole determinant for staffing-level decisions each fiscal year. The ASTARS model is a tool used to provide managers with macro-level resource guidance. For instance, the ASTARS model forecasts out-year (beyond FY 2021) staffing levels for AFS inspectors, AIR inspectors, AIR engineers and AAM medical certification and ATC medical clearances. The macro-level resource guidance is further refined with expertise and judgment from Regional Flight Surgeons, field managers, division managers, executive management, and SMEs to finalize staffing decisions. This is consistent with the National Academy of Sciences 2006 report, which recommended the incorporation of subject matter expertise with model results.

# LOOKING FORWARD

This section provides anticipated workforce needs, estimated levels of attrition and the planned hiring for AVS from FY 2020 to FY 2029.

FY 2019 is shown in each figure below to illustrate end-of-fiscal-year actual levels. Detailed views into anticipated staffing requirements for safety critical and operational support personnel, as well as ASIs and ASEs, are also presented in the following pages.

Figure 8, Total AVS Forecast with Planned Hires and Estimated Losses, projects estimated losses due to natural attrition, retirements, net transfers and other losses. In FY 2019, actual losses were 401, including 301 positions due to retirement. The projected average annual attrition is 433 positions for FY 2020 through FY 2029.

Figure 8 also illustrates planned hires for the AVS workforce over the next 10 years and compares FY 2019 actual data with FY 2020 and out-year projections. In FY 2019, actual hires were 326, 46 percent below the plan of 605. Our challenges finding qualified applicants continued throughout the fiscal year, primarily due to the tight labor market. The planned hiring target for FY 2020 is 669, and the projected average annual hiring is 549 positions for FY 2020 through FY 2029. This hiring target reflects the number of positions required to fulfill the needs discussed in the Forecasting AVS Needs section.

In addition, as a result of the recommendations from multiple expert panels following the 737 MAX accidents, we plan to hire additional staff with expertise in human, systems safety engineering, software engineering, manufacturing and industrial engineering, data analytics and science, and international aviation safety standards.

## Figure 8 | Total AVS Forecast With Planned Hires and Estimated Losses

FY 2019 actual staffing level, actual hires and actual losses, as well as planned staffing levels, planned hires and estimated losses for FY 2020 through FY 2029, for all of AVS.



## Figure 9 | ASI Forecast with Planned Hires and Estimated Losses

FY 2019 actual staffing level, actual hires and actual losses, as well as planned staffing levels, planned hires and estimated losses for FY 2020 through FY 2029, for all ASIs in AVS.

## Figure 10 | ASE Forecast with Planned Hires and Estimated Losses

FY 2019 actual staffing level, actual hires and actual losses, as well as planned staffing levels, planned hires and estimated losses for FY 2020 through FY 2029, for all ASEs in AVS.
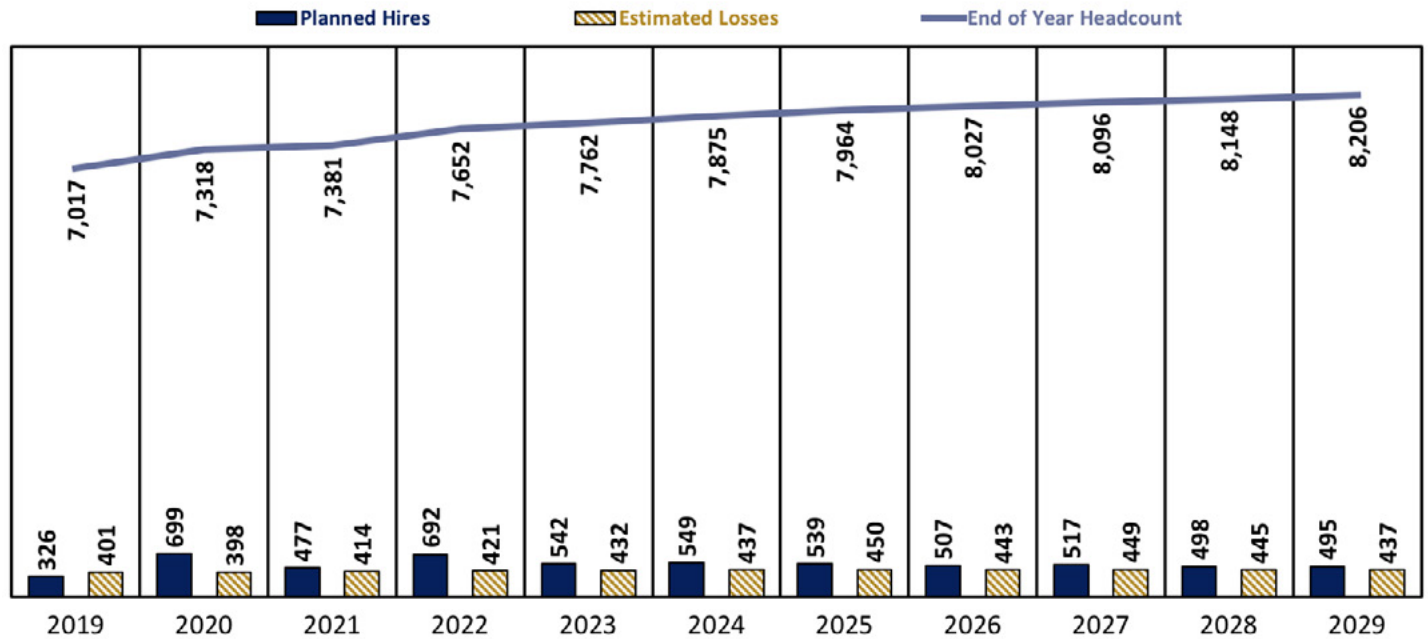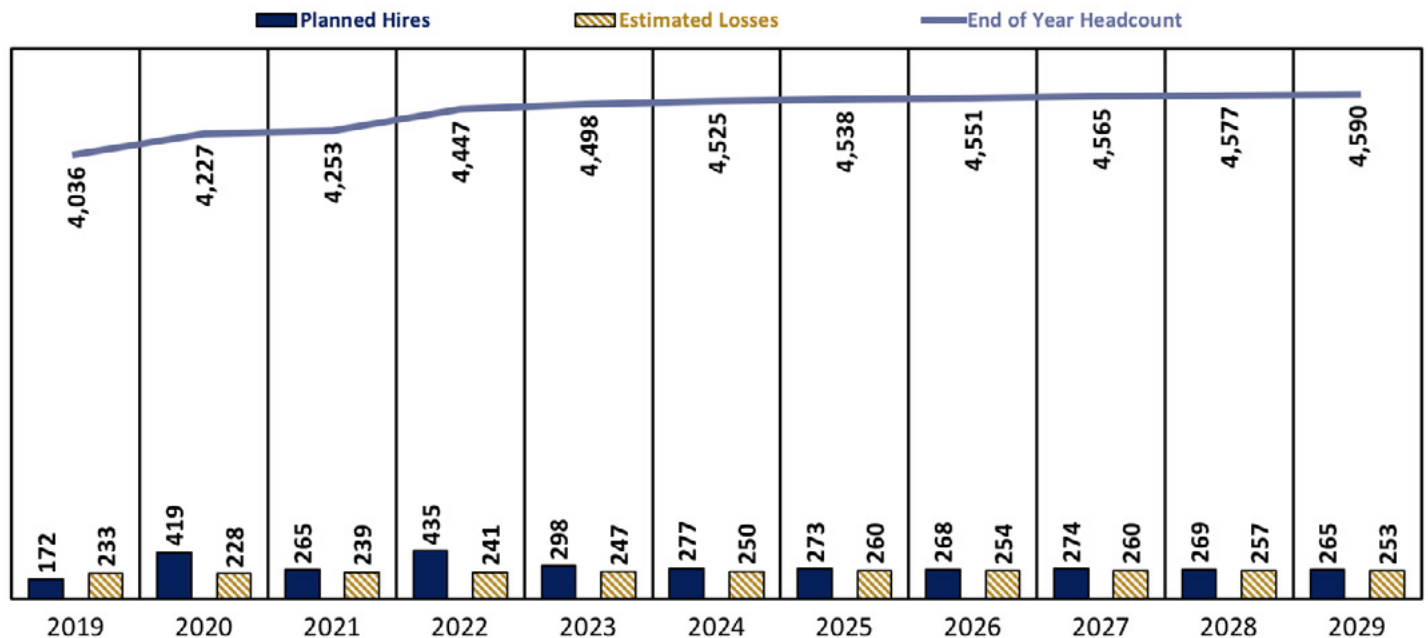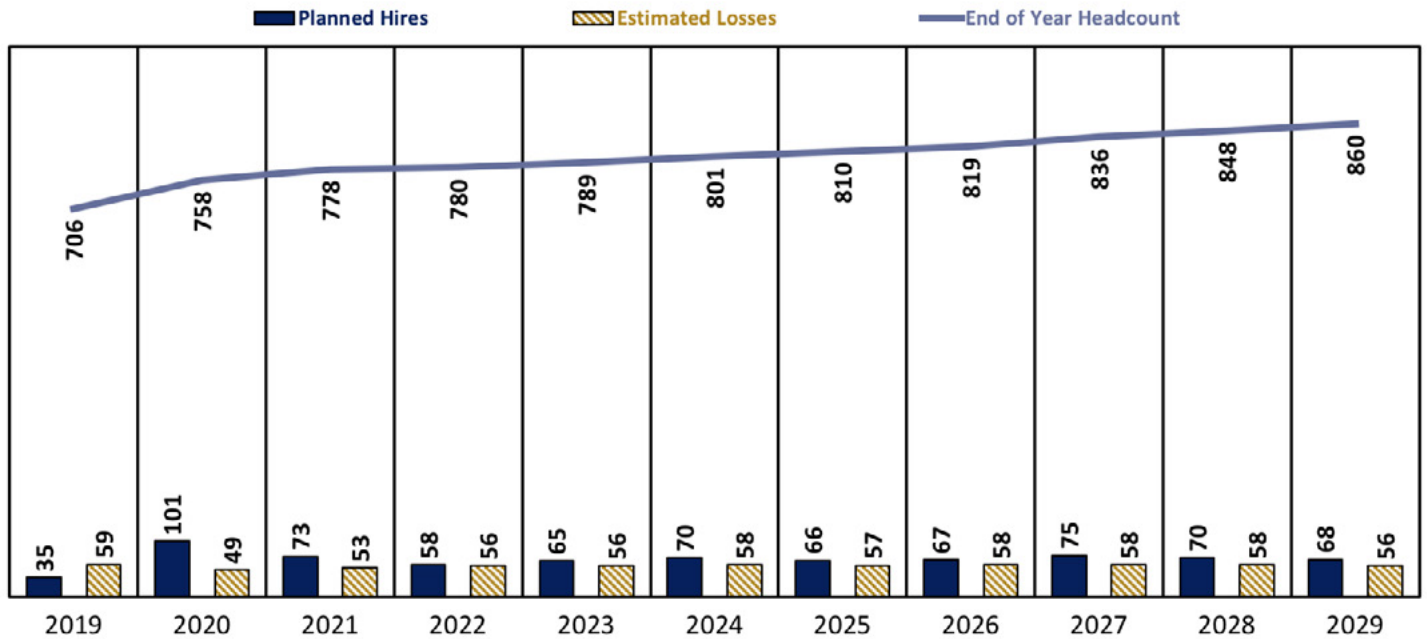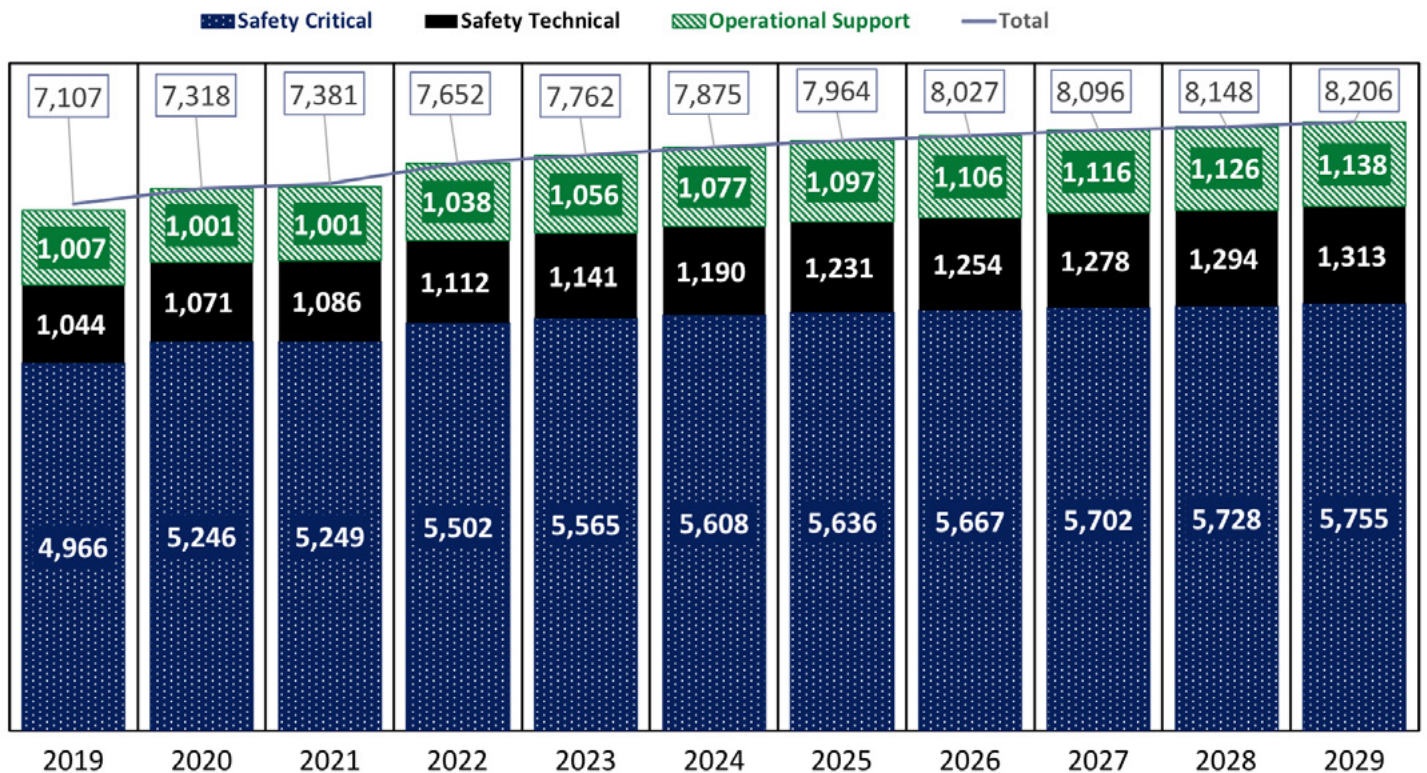


## Figure 11 | Projected Staff by Staffing Category

Anticipated needs specifically for Safety Critical Staff, Safety Technical Staff and Operational Support Staff.

# SUCCESSION PLANNING

AVS tends to hire a very experienced safety workforce for many of its positions. The average age of AVS employees when hired is 46 and the current average age of AVS employees is 54. Over the last two years, the average age at retirement for AVS personnel was 66. Past behavior reflects that a low percentage of employees actually retire immediately upon becoming eligible, and there is no mandatory retirement age for AVS employees. Figure 12 shows the historical rates of retirement with respect to year of eligibility.

**Figure 12 | Percent of AVS Employees Retiring By Year of Eligibility**
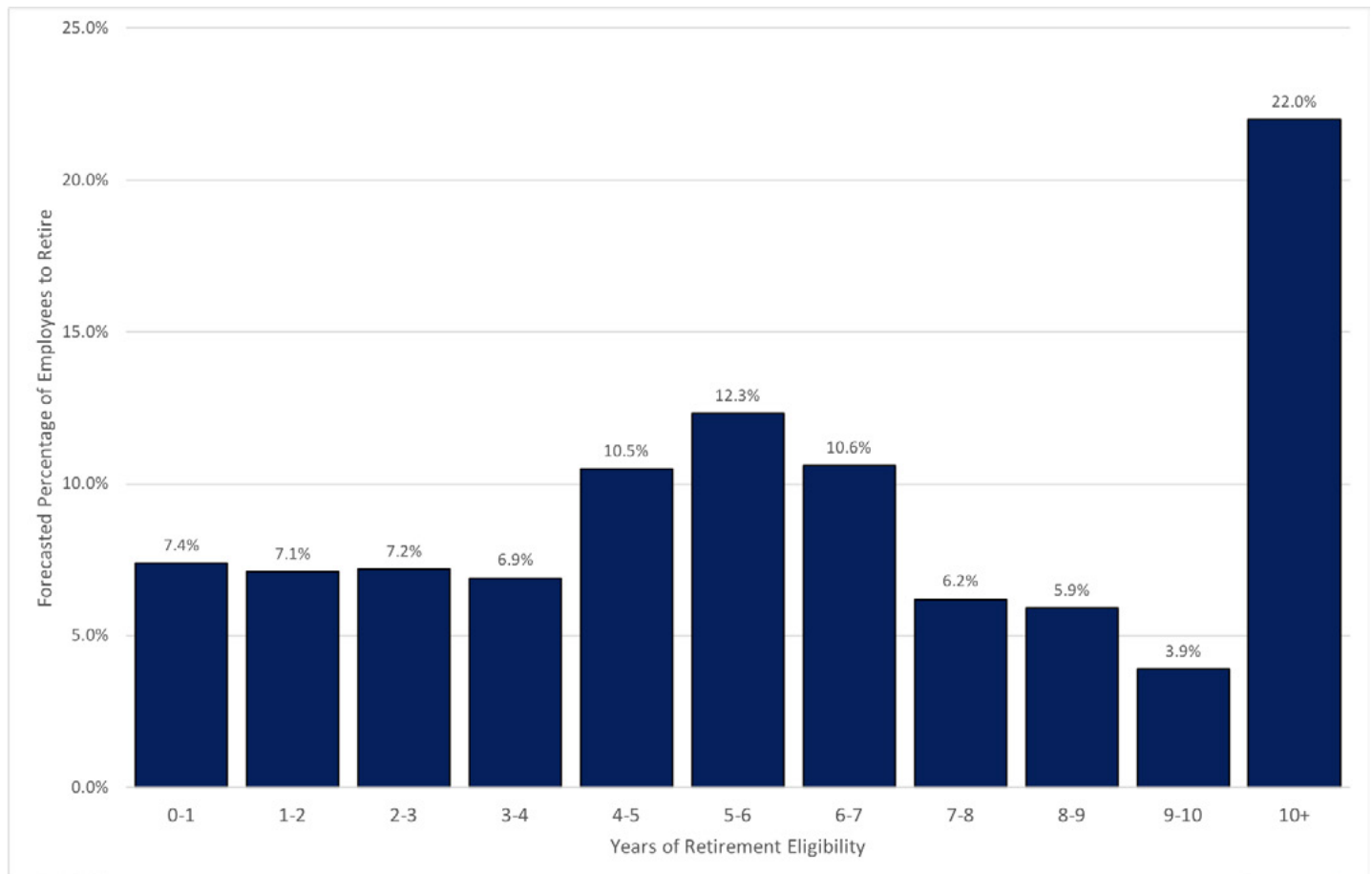


Forecasted percentage of AVS employees expected to retire during each year of retirement eligibility.

In FY 2020, AVS will leverage knowledge gained through federal best practices for Succession Planning in order to assess talent readiness, career desire and development gaps, while mitigating the potential loss of talent and experience. AVS continues to focus on building and maintaining a pipeline of skilled employees trained and prepared to take on roles of increasing responsibility using recruitment, retention and development initiatives as detailed in the following sections.

# Recruitment Plan

To operate successfully in a more collaborative and technologically advanced environment, AVS must continue to build a workforce adept at risk-based, data-driven decision making, as well as systematic, critical thinking. AVS must compete with private industry and other government agencies to recruit the best candidates from a specialized talent pool. The FAA recognizes the ongoing challenge to identify and attract talent into key safety positions and we are pursuing a number of initiatives, activities and incentives to do so.

The primary recruitment and hiring vehicle AVS uses is FAA Jobs, an automated system used by applicants, managers and HR professionals to facilitate the overall application and selection process for positions. FAA Jobs is integrated into the Office of Personnel Management's (OPM) automated hiring system, USAJOBS. This integration has allowed AVS to reach a wider pool of candidates for all of its positions.

AVS continues to use the FAA's Managerial and Employee Leadership Competency Profiles to correlate and define interpersonal and business competencies when recruiting for positions. This core competency model is used to describe a baseline-mastery level of core business and interpersonal competencies, as well as specific technical competencies required across the organization.

This model allows us to compare the competencies of individual employees against the requirements of individual positions across AVS. As a result, competencies enable individuals to:

- Better understand how their individual and group job functions support the AVS mission
- Identify how their individual competency profiles compare to the competencies required across AVS

Use of assessment tools allows AVS to fill safety critical positions with individuals who possess the skills needed to support the implementation of SMS and NextGen. Specifically, the competency model provides a systematic approach of looking at the entire lifecycle of any existing position to determine what is required for the incumbent to successfully perform the assigned duties.

AVS also continues to use core interpersonal and business competencies as a part of the Knowledge, Skills and Abilities (KSA) assessment when creating vacancy announcements. AVS has adopted an Agency-wide hiring practice of conducting a thorough job analysis on all of its positions to ensure an accurate and timely assessment of the duties to be performed and competencies required.

In an effort to build a sufficient talent pipeline to address the evident shortage of qualified pilots and aviation mechanics, AVS hosted its second annual STEM Career Symposium. During the symposium, Washington, D.C. area middle and high school students engaged in hands-on aviation safety demonstrations and were encouraged to consider aviation careers. Our path forward in FY 2020 will include an increased focus on early outreach and education efforts with the next generation of aviation professionals.

## Operational Support Hiring

AVS is composed mostly of technical employees, such as inspectors, engineers, pilots, physicians and accident investigators. Operational support personnel in field facilities, regional offices and headquarters provide business and administrative support to technical employees.

Although AVS places significant emphasis on hiring initiatives for safety critical positions, AVS is equally committed to attracting and retaining its operational support workforce. In contrast to the limited number of qualified candidates available to fill safety critical positions, AVS is not experiencing significant challenges staffing operational support positions and has a growing talent pool of qualified candidates.

## Entry-Level Hiring

To strengthen the AVS pipeline of candidates who will eventually replace retiring leaders, AVS continues to focus on the goal of recruiting new hires in safety critical occupations at lower pay bands/grades. Over the last four fiscal years, AVS has participated in over 100 recruitment and outreach events to help reach and provide career opportunity information to talent at the entry level, including career fairs at colleges and universities, collegiate information sessions and professional conferences. AVS plans to continue such outreach efforts in FY 2020.

This fiscal year, AVS will continue to aggressively recruit and hire technically skilled employees at the entry level who can gain the knowledge and experience required to carry out the safety mission. In addition, AVS has made changes to the way it recruits for the lower-level positions, such as Aviation Safety Technicians (AST). Changes include greater use of plain language in announcements and increasing the recruitment and outreach footprint in certain locations.

## Compensation Incentives

To better compete with aviation industry recruitment practices, AVS offers a number of incentives, such as leave enhancements (included in job announcement), new hire pay flexibilities, telework, and degree completion programs.

In FY 2018, AVS introduced recruitment incentives for Operations ASIs, including on-the-spot hiring authority and higher entry-level employee salaries to increase the pool of eligible applicants. In 2019, we proposed a referral incentive specifically for ASIs, in an effort to increase the pool of eligible applicants and engage the workforce in referring candidates. These incentives are being piloted in the Flight Standards organization, and wherever possible, we will extend them to other Aviation Safety units. These incentives include:

- On-the-spot hiring authority
- Higher entry-level employee salaries (within the same grade)
- $10,000 recruitment incentive (with a 2 year service agreement) for hard-to-fill locations
- $10,000 relocation incentive (with a 1 year service agreement) offered to applicants moving more than 100 miles to their new duty location
- Paying for candidates to travel to interviews

We are also developing exciting new recruitment, retention, relocation and outreach hiring initiatives.

- We are establishing partnerships with colleges and universities across the United States, with the intention to hire engineers immediately after graduation in fields like aircraft certification.
- In areas like aircraft certification, entry-level engineers will take part in a customized training program for the first two years of federal service. This represents the FAA's investment in their future by providing specific training, mentoring, coaching and on-the-job opportunities in order to groom them for their exciting new career in aviation.

A particularly hard-to-fill position is Medical Officers. As such, the FAA has granted the Office of Aerospace Medicine Direct Hire Authority, which reduces the time to recruit Medical Officers.

To promote our hiring incentives and flexibilities, the FAA is engaged in targeted recruitment efforts at professional conferences, career fairs, aviation events and airshows, as well as through social media, to reach a greater pool of applicants nationwide.

## DIVERSITY AND INCLUSION

AVS has continued its collaboration with the Office of Human Resource Management (AHR) and the Office of Civil Rights (ACR) to conduct ongoing analyses of hiring practices. This ensures AVS is able to assess best practices and identify potential barriers to developing and improving hiring procedures. The analysis also allows AVS to conduct briefings and provide training materials for hiring managers that will keep them informed and equipped with the resources and tools necessary to hire candidates with the right skill sets for the job.

In FY 2015, a barrier analysis was completed to identify potential barriers in the hiring process for ASI positions that could limit employment opportunities for individuals of a particular race, ethnic background, gender or those with disabilities. The analysis found potential barriers to attracting diverse candidates to AVS and provided valuable information on how the hiring process can be standardized and improved to ensure fairness and equity. In FY 2019, AVS continued to collaborate with AHR to implement actions from the barrier analysis Corrective Action Plan (CAP), which identified strategies to further improve and standardize the hiring process. AVS worked with AHR and ACR to implement and complete the identified strategies in December 2017.
Those implemented corrective actions will continue to be monitored and evaluated on an ongoing basis in FY 2020 to ensure they are working as intended.

AVS continues to collaborate with AHR, ACR, the Office of the Chief Counsel (AGC) and members of FAA employee associations to develop and implement diversity and inclusion strategies designed to ensure the organization is attracting and hiring talented applicants from diverse backgrounds, which supports the FAA's strategic initiative to create a workforce with the leadership, technical and functional skills necessary to ensure the U.S. has the world's safest and most productive aviation sector.

FY 2019 marked the six-year anniversary of the AVS Diversity and Inclusion Work Plan, which established long-term goals, strategies and actions to assist managers in successfully recruiting, hiring, promoting, educating and retaining a more diverse workforce. It also identified initiatives that help build a culture that encourages respect, collaboration, flexibility and fairness. Since FY 2014, AVS made improvements to integrate key diversity and inclusion initiatives into work processes and business plans and will continue to advance those key initiatives and goals in FY 2020.

**Figure 13 | AVS Diversity and Inclusion**

The AVS Diversity and Inclusion Work Plan establishes long-term goals, strategies and actions to assist managers to successfully recruit, hire, promote, educate and retain a more diverse workforce.

**AGENCY GOALS**

| Workforce Diversity | Workforce Inclusion | Sustainability |
|---|---|---|
| AVS shall recruit from a diverse, qualified group of potential applicants to secure a high-performing workforce drawn from all segments of American society. | AVS shall cultivate a culture that encourages collaboration, flexibility, and fairness to enable individuals to contribute to their full potential and further retention. | AVS shall develop structures and strategies to equip leaders with the ability to manage diversity, be accountable, measure results, refine approaches on the basis of such data, and engender a culture of inclusion. |

Since its implementation, AVS completed over 50 activities contained in the plan. For example:

- Required Equal Opportunity Employment (EEO) and diversity and inclusion training for new AVS managers and employees, which is delivered through the AVS Overview and Crucial Accountability Courses
- Established a recruitment and outreach program targeting diverse audiences
- Established a policy mandating that AVS managers engage in mediation when requested by employees
- Instituted a process to track engagement in Alternative Dispute Resolution
- Instituted a process to track the timeliness of reasonable accommodation requests
- Promoted Persons with Disabilities hiring and internship opportunities
- Participated in the Office of Civil Rights (ACR) agency-wide EEO Action Committee Workgroups for women, Hispanics, and Persons with Targeted Disabilities (PWTD)
- Engaged with the National Employee Forum/Employee Associations Annual Training Conferences
- Instituted a virtual annual AVS EEO Training Week

As an example of increasing diversity, AVS supported the Agency's PWTD hiring initiative. Between FY 2013 and FY 2019, AVS hired 64 PWTD, which represented an average of a 2.76 percent PWTD new hire rate for AVS. In FY 2020, AVS will continue to promote and support the hiring of people with disabilities and targeted disabilities.

Also in FY 2019, AVS supported ACR by hosting nine training sessions covering multiple EEO topics. The FY 2019 goal was to train 70 percent of managers and 20 percent of employees. AVS exceeded this goal, training 82 percent of managers and 28 percent of employees.

# RETENTION PLAN

## Employee Engagement

Once AVS hires an employee, the focus shifts to retention. To increase employee satisfaction and engagement levels, AVS continues to strive to become a workplace of choice by ensuring:

- Employees have a professional, open, transparent, and safe work culture that encourages innovation, empowerment, and growth
- Training stays current with Agency strategic challenges and strengthens leadership and technical competencies
- Employees have the opportunity to participate in development programs to strengthen leadership skills

Senior leaders take an active role in communicating with and engaging employees by:

- Using Town Hall meetings to update AVS employees on current activities and accomplishments
- Conducting site visits to offices throughout the country
- Encouraging participation in the U.S. Department of Transportation's (DOT) IdeaHub, a DOT-wide online collaborative tool used to create ideas and help shape solutions for improving the FAA's workplace
- Distributing the AVS Flyer, an internal communications resource emailed to all AVS employees with weekly content updates
- Holding various meetings and conferences to provide managers and other employees with the resources and skills needed to better support day-to-day operations
- Participating in panel discussions with new employees at the Aviation Safety Overview Course
- Using the Federal Air Surgeon Bulletin to communicate with AAM employees
- AAM also provides information to employees via conferences and summits
- Monthly brown bag meetings with small groups of employees and senior leadership

# WORKFORCE DEVELOPMENT PLAN

## Training Goals

Aligning workforce development and training with future needs is one of AVS's strategic initiatives. Periodically, an inventory is made of the required skills and competencies, and where needed, the staff and training resources are located or developed. Understanding that the role of the regulator is to manage risk and provide safety oversight, we provide and maintain a well-trained workforce that aligns with enterprise needs. An environment that supports learning, diversity, and inclusion allows the workforce to adapt rapidly to emerging needs. Career opportunities that promote organizational health are encouraged.

AVS develops its workforce by providing employees with necessary training to ensure they have the knowledge and skills needed to respond to aviation safety challenges and assume roles of increasing responsibility. AVS training leverages a combination of innovative training, including synchronous WBT (student and instructor present at the same time), asynchronous WBT (self-paced), and traditional classroom-based instruction. Although AFS, AIR, AAM, and AOV maintain their own training organizations, their efforts align with and support AVS's overarching workforce development program, which focuses on the development, delivery, and evaluation of specialized technical training. AVS workforce development goals include:

- Identifying training needs and requirements for inspectors, engineers, and other safety critical occupations
- Providing training and professional development opportunities to fill any skill or competency gap and to enhance current performance
- Continuing to use technology for training delivery as appropriate (e.g., Blackboard, training webinars, self-paced WBT, and mobile learning)
- Implementing the FAA Compliance Program in curricula where applicable, including the AVS 101 Webinar and the AVS Overview Course
- Reinforcing AVS curricula with risk-based decision making concepts
- Providing an AVS 101 Webinar to all new hires
- Continuing to deliver diversity and inclusion concepts through the AVS Overview Course for new hires and the Leading & Leveraging Diversity Course for managers

## Figure 14 | Agency Training Types

Figure 14 explains the distinction between several types of training AVS provides its workforce.

| AGENCY TRAINING | | |
|---|---|---|
| **Initial Technical Training** | **Recurrent Technical Training** | **Managerial/ Leadership Training** |
| AVS provides initial technical training within the first 12 months of employment using the blended training model. Courses are provided online and in the classroom and are tailored to staff specialization. | AVS calls for annual role-based, competency-focused training requirements. A new tool has been implemented to monitor and revise training needs throughout the year. | AVS continues to identify gaps between Agency-level programs and AVS requirements. Active participation has remained with the redesign of Agency-level curriculum as well as management training. |

## Initial Technical Training

Training provided to new Safety Critical Operational Staff varies across the different Services and Offices and ranges from one to 15 weeks, depending on a new hire's specialty. For most employees, initial technical training is provided within the first 12 months of employment. AVS uses a blended training delivery model, with some components delivered through online courses and others in the classroom. Flight Standards has four main areas of technical specialization:

- General Aviation Operations
- General Aviation Airworthiness
- Air Carrier Operations
- Air Carrier Airworthiness

Each of the four areas listed above require a series of initial courses called "string training." AIR requires all Safety Critical Operational personnel to attend AIR Indoctrination training to introduce and familiarize employees with AIR's mission and values. This is followed up with other training based on the employee's anticipated role in the organization. Safety Critical Operational Staff also take required training in functional specific areas such as:

- Aerospace Engineering (Airframe, Propulsion, Systems, and Software)
- Aviation Safety Inspection-Manufacturing
- Delegation Management
- Flight Testing

Employees with other technical specialties in AVS (e.g., Drug Abatement Inspectors, Air Traffic Safety Inspectors, and Rulemaking staff) receive structured initial technical training specific to their field of expertise. Employees involved in rulemaking activities are provided detailed training on the regulatory drafting and rulemaking and exemption processes.

## Additional/Recurrent Technical Training

After employees complete the initial technical courses, AVS identifies additional training needs during annual calls for training requirements. These requirements are role-based and focused on competency. Supervisors work with their employees to determine what kind of training employees need and when they need it. Supervisors also evaluate the skill sets represented in their offices to determine if employees require additional skills. Inspectors, designee advisors, and flight test pilots are required to receive initial and recurrent training tailored to their particular job responsibilities. Supervisors and their employees continually review training requirements in order to keep pace with changes in the aviation industry.

In FY 2014, AVS implemented the Consolidated Management Resource Information System (CMRIS), a "call for training" tool for AFS and AIR that provides greater flexibility to monitor and revise training needs throughout the year.

## Managerial/Leadership Training

Of the 955 AVS executives and managers, 305 are currently eligible for retirement, representing 32 percent of the management population. Within the next one to five years, another 281 will become retirement eligible, representing an additional 29 percent of the management population.

Like other positions within AVS, executives and managers are not required to retire immediately upon eligibility. However, it is important to build and maintain a pipeline of skilled employees who are trained and prepared to take on roles of increasing responsibility.

AVS strongly encourages personnel to participate in leadership development opportunities offered by the Agency, such as the Program for Emerging Leaders for staff-level personnel aspiring to be managers, the Federal Executive Institute for all levels of management, and the Senior Leadership Development Program for high potential senior managers.

In FY 2019, AQS piloted a Succession Planning Program for front line managers. The goal of the program is to develop a pipeline of managers ready to assume more senior roles within AVS/FAA.

AQS continues to train AVS managers in effective communications via the Crucial Accountability (CA) course. The CA course has reached all eight Services and Offices. AVS continues to conduct the AVS Overview Course for all new AVS employees, which includes a panel session with senior AVS leadership.

AFS continues to use its Curriculum Oversight Team (COT) to oversee the curriculum for managers, implement content that focuses on leadership and communication skills, and streamline content across various mandatory training courses. In addition, the COT oversees the common curriculum requirements that impact multiple courses and provide corporate leadership with strategies and policies that impact the training required by managers. The approach is a blend of activities related to organizational health, coaching, mentoring, and training. AVS will continue to monitor AFS initiatives to consider expanding their management and leadership activities across all Services and Offices.

# FUNDING

Staffing is AVS's largest cost. Because personnel compensation and benefits consumed over 84 percent of the AVS FY 2019 operational budget, controlling these costs will be critical to the long-term sustainability of operations.

AVS continues to monitor hiring and staffing to control pay, compensation, and benefit costs.

AVS requires specialized training and equipment as well as supplies, travel, and other non-payroll funding for its employees to perform the organization's safety oversight and surveillance responsibilities effectively. AVS policy is to maintain a mobile workforce that is both trained and equipped to carry out the organization's safety mission.

**Figure 15 | Personnel Compensation and Benefits (PC&B) and Non-PC&B Shares**

AVS actual and projected percentage funding by fiscal year and major object classification.
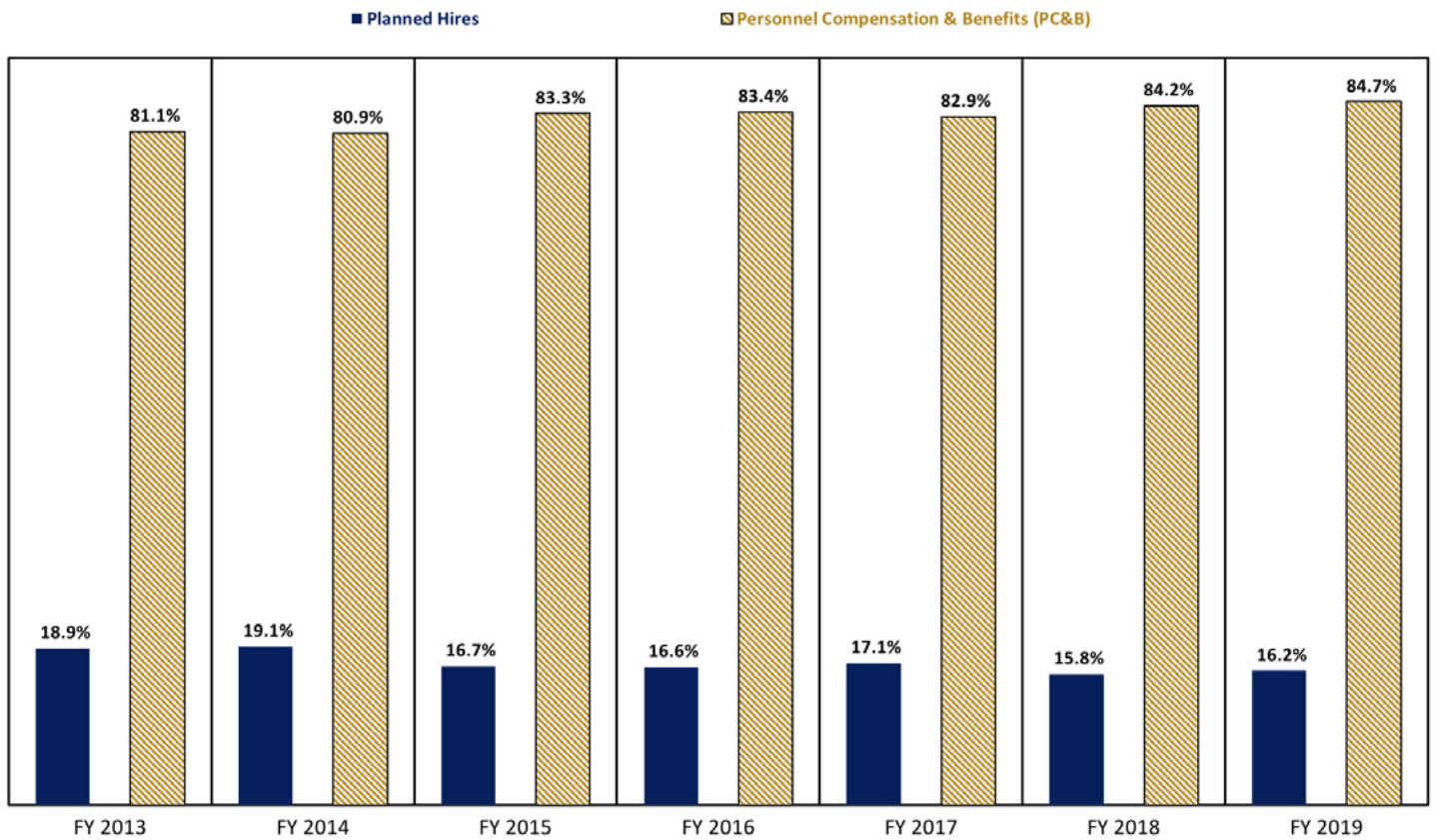
# SUPPLEMENTAL INFORMATION: Appendices

## Appendix 1 | AVS Staffing (Operations Appropriation)

Legend: ▨ Safety Critical  ▪ Safety Technical  ▨ Operational Support

| End-of-Year Employment—Full-Time Positions (FTP) | FY 2019 Actual | FY 2020 Enacted | FY 2021 Requested |
|---|---|---|---|
| **FLIGHT STANDARDS** | | | |
| Engineers | 17 | 21 | 21 |
| Aviation Safety Inspectors | 3,800 | 3,941 | 3,947 |
| Safety Technical Specialist Staff | 411 | 461 | 466 |
| Operational Support | 742 | 710 | 710 |
| Total | 4,970 | 5,133 | 5,144 |
| **AIRCRAFT CERTIFICATION** | | | |
| Pilots, Engineers, and CSTAs | 706 | 758 | 778 |
| Aviation Safety Inspectors | 236 | 286 | 293 |
| Safety Technical Specialist Staff | 224 | 188 | 198 |
| Operational Support | 127 | 152 | 152 |
| Total | 1,293 | 1,384 | 1,421 |
| **AEROSPACE MEDICINE** | | | |
| Physicians, Physician Assistants, Nurses | 54 | 61 | 63 |
| Alcohol/Drug Abatement Inspectors | 59 | 61 | 61 |
| Safety Technical Specialist Staff | 233 | 245 | 245 |
| Operational Support | 41 | 43 | 43 |
| Total | 387 | 410 | 412 |
| **AIR TRAFFIC SAFETY OVERSIGHT** | | | |
| Aviation Safety Inspectors | 72 | 79 | 79 |
| Safety Technical Specialist Staff | 45 | 46 | 46 |
| Operational Support | 9 | 5 | 5 |
| Total | 126 | 130 | 130 |
| **RULEMAKING** | | | |
| Safety Technical Specialist Staff | 32 | 36 | 36 |
| Operational Support | 3 | 4 | 4 |
| Total | 35 | 40 | 40 |
| **ACCIDENT INVESTIGATION AND PREVENTION** | | | |
| Aviation Safety Investigators | 9 | 14 | 14 |
| Safety Technical Specialist Staff | 50 | 49 | 49 |
| Operational Support | 12 | 17 | 17 |
| Total | 71 | 80 | 80 |
| **UMANNED AIRCRAFT SYSTEMS INTEGRATION** | | | |
| ASIs and ASEs | 13 | 25 | 25 |
| Safety Technical Specialist Staff | 39 | 32 | 32 |
| Operational Support | 17 | 18 | 18 |
| Total | 69 | 75 | 75 |
| **QUALITY, INTEGRATION, AND EXECUTIVE SERVICES AND AVS EXECUTIVE STAFF** | | | |
| Safety Technical Specialist Staff | 10 | 14 | 14 |
| Operational Support | 56 | 52 | 52 |
| Total | 66 | 66 | 66 |
| **ODA (WITHIN AVS)** | | | |
| Safety Criticial Staff (ASIs & ASEs) | | | 13 |
| **GRAND TOTAL** | | | |
| Total Safety Critical Staff | 4,966 | 5,246 | 5,281 |
| Total Safety Technical Staff | 1,044 | 1,071 | 1,086 |
| Total Operational Support Staff | 1,007 | 1,001 | 1,001 |
| Total | 7,017 | 7,318 | 7,381 |

## Appendix 2 | Aviation Safety Primary Stakeholders as of December 2019

### Air Operator Certificates: 5,392

| | |
|---|---|
| 80 | Major U.S. Air Carriers |
| 2197 | Commuter Air Carriers/On Demand Air Taxi |
| 76 | Commercial Operators |
| 501 | Foreign Air Carriers |
| 377 | External Load (e.g., Logging, Oil Platforms) |
| 1,845 | Agricultural Operators |
| 316 | Public Use Authorities (e.g., State/City/Police) |

### Air Agency Certificates: 6,856 (Including Inactive Satellites)

| | |
|---|---|
| 929 | Pilot Training Schools |
| 5,336 | Repair Stations |
| 205 | Maintenance Training Schools |
| 386 | Pilot Training Centers |

### Registered Manned Aircraft: 291,184

### Registered Unmanned Aircraft: 1,493,687

| | |
|---|---|
| 413,360 | Online Commercial |
| 4,241 | Paper Commercial |
| 1,076,086 | Online Hobby |

### Check Airmen: 9,823

| | |
|---|---|
| 5,992 | Part 121 |
| 126 | Part 121/135 |
| 3,705 | Part 135 |

### Designees: 8,810

| | |
|---|---|
| 2,326 | Aircraft Certification |
| 3,830 | Flight Standards |
| 2,611 | Aerospace Medicine |

### Foreign Authorities/Entities with Bilateral Agreements:

### 47 Foreign Civil Aviation Authorities: 193

### Foreign Accident Investigation Authorities: 187

### Flight Instructors: 112,427

### Mechanics with Inspection Authority: 21,097

### Approved Manufacturers: 1,518

### Active Pilots: 852,414

| | |
|---|---|
| **170,050** | Airline Transport |
| **116,579** | Commercial |
| **173,447** | Private |
| **137** | Recreational |
| **6,401** | Sport |
| **191,890** | Student |
| **43,107** | Foreign |
| **150,803** | UAS Remote |

### Non-Pilot Air Personnel: 716,010

| | |
|---|---|
| **316,717** | Mechanics/Repairmen |
| **25,015** | Control Tower Operators |
| **243,468** | Flight Attendants |
| **69,532** | Ground Instructors |
| **61,278** | Other (e.g., dispatchers, flight navigators, parachute riggers, flight engineers) |

### ATCS Medical Clearance Exams: 12,270

| | |
|---|---|
| **12,188** | Air Traffic Controller Workforce |
| **82** | Flight Service Station Workforce |

### ATO Credentialed Personnel: 16,709

### Airmen Medical Examinations: 383,101

| | |
|---|---|
| **34,889** | Special Issuances |
| **348,212** | Standard Issuances |

### Non-Certificated Operators: 2,226

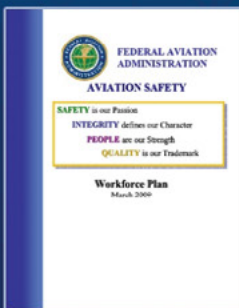| | |
|---|---|
| **1,441** | Contractors |
| **9** | Non-FAA/Military ATC Facilities |
| **776** | Sightseeing Operators as defined under 14 CFR 91.147 |

### Aviation Industry Entities Covered by Anti-Drug and Alcohol Programs: 6,833

### National Transportation Safety Board Recommendations and Requests: 5,388

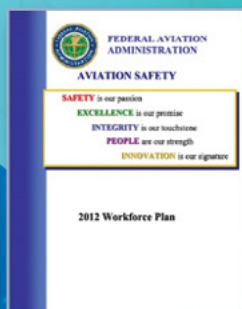| | |
|---|---|
| **251** | Open NTSB Safety Recommendations |
| **4,787** | Closed NTSB Safety Recommendations |
| **350** | Formal NTSB Requests for FAA Research and Information |

**2008**

**2009**

**2010**

**2011**

**2012**

**2013**

**2014**

**2015**

**2016**

**2017**

**2018**

**2019**

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

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