

# SUMMARY OF INSPECTOR GENERAL'S TOP MANAGEMENT AND PERFORMANCE CHALLENGES

The Reports Consolidation Act of 2000 requires the Inspector General (IG) to identify and report annually on the most serious management and performance challenges that federal agencies face. The Department of Transportation (DOT) IG's report highlights urgent issues facing DOT. The IG's report that summarizes the challenges DOT will face in FY 2021 was issued on October 21, 2020, and is available on the IG's website at <https://www.oig.dot.gov/> and on the FAA's website at [http://www.faa.gov/about/plans\\_reports](http://www.faa.gov/about/plans_reports).

On October 23, 2019, the IG issued its memorandum identifying the top management and performance challenges that DOT would be facing in FY 2020. The IG's memorandum is provided below, and while it is titled "DOT's Fiscal Year 2020 Top Management Challenges," the report addresses both management and performance challenges for the department. The pages immediately following contain a summary prepared by the FAA of the challenges specifically applicable to the agency and the actions it took during FY 2020 to address those challenges. The FAA provides this summary in order to present a comprehensive perspective on the FAA's FY 2020 performance activities.



Above: View of an airplane flightdeck. Photo by neONBRAND/Pixabay.



Above right and right: Screenshots taken from "Straight from Steve - Steve flies the 737 MAX", show the FAA's Administrator Steve Dickson inspecting the 737 MAX and landing during the FAA's evaluation of Boeing's proposed changes. See "Crosscheck Your Knowledge" article on page 73 of this document for more information.

Of the 24 key challenges identified by the Inspector General for FY 2020, DOT tasked the FAA with addressing the following 12 challenges:

- **Resolving certification issues related to the Boeing 737 MAX aircraft**
- **Enhancing FAA's oversight of aircraft certification processes**
- **Balancing collaboration and enforcement through FAA's Compliance Program**
- **Overseeing air carriers' new systems for managing safety risks**
- **Sustaining and modernizing the En Route Automation Modernization (ERAM) system while integrating new capabilities**
- **Realizing the anticipated benefits of Automatic Dependent Surveillance-Broadcast (ADS-B) investments**
- **Resolving obstacles to implementing new flight procedures and delivering benefits to airspace users**
- **Auctioning off electromagnetic spectrum to finance and deploy new radars**
- **Addressing longstanding cybersecurity vulnerabilities and strengthening internal controls**
- **Implementing congressionally mandated aviation cybersecurity initiatives to protect flight-critical systems**
- **Safely integrating Unmanned Aircraft Systems (UAS) and the commercial space industry into the national airspace system**
- **Supporting R&D and reshaping the workplace to meet future needs**

After the Inspector General's report was issued, the FAA coordinated with DOT to develop an "Action Plan" that listed actions and timelines for addressing each of the challenges. The FAA then developed an "Actions Taken" report that describes the progress the FAA made throughout FY 2020 in addressing each of the challenges. These Actions Taken reports, initial Action Plans, and the Inspector General's comprehensive report identifying top management challenges for FY 2020 are posted on FAA's website at [http://www.faa.gov/about/plans\\_reports/](http://www.faa.gov/about/plans_reports/) under the DOT IG Top Management Challenges section.

## Resolving certification issues related to the Boeing 737 MAX aircraft

### *Why this is a challenge*

The FAA's first priority is always safety. The tragic loss of Lion Air Flight 610 and Ethiopian Airlines Flight 302 are sober reminders of the importance of our mission. The FAA is carefully considering all recommendations as we continue our review of the proposed changes to the Boeing 737 MAX. The FAA is committed to ensuring that the lessons learned from the losses of Lion Air Flight 610 and Ethiopian Airlines Flight 302 will result in an even greater level of safety globally.

### *Progress in meeting the challenge*

- The FAA's decision regarding the return to service of the 737 MAX will be based on the agency's assessment of the sufficiency of Boeing's proposed software updates and pilot training to address the known issues for which the FAA grounded the aircraft. When the FAA decides to return the Boeing 737 MAX to service, that action will be applicable to U.S. carriers operating in U.S. airspace.
- During evaluation of Boeing's proposed modifications, the FAA has retained all compliance findings and approvals associated with the design changes related to Maneuvering Characteristics Augmentation System. This thorough review has taken more than 18 months and included the full-time work of a team of 40+ people that included engineers, inspectors, pilots, and technical support staff. The effort represents more than 60,000 FAA hours of review, certification testing, and evaluation of pertinent documents. This has so far included approximately 50 hours of FAA flight or simulator tests and FAA analysis of more than 4,000 hours of Boeing flight and simulator testing.
- The Special Committee to review the FAA's Aircraft Certification Process delivered its recommendations to the Secretary of Transportation in January 2020. In April, the FAA published its official response to the Special Committee's report outlining the actions, both planned and underway, FAA is taking to address the recommendations. The FAA is in the process of putting the infrastructure in place to be able to carry out these critical recommendations.
- The FAA published a Notice of Proposed Rulemaking, Airworthiness Directive (NPRM AD) for public comment

on August 6, 2020. The NPRM AD outlines the following design changes needed to the 737 MAX that address the unsafe condition:

- installing new flight control computer software
  - revising the existing Airplane Flight Manual to incorporate new and revised flight crew procedures
  - installing new 737 MAX display system software
  - changing the horizontal stabilizer trim wire routing installations
  - completing an angle of attack sensor system test, and
  - performing an operational readiness flight.
- The comment period on the NPRM closed on September 21, 2020. The FAA is carefully reviewing the public comments received and will incorporate them into a Final Rule AD.
  - On September 30, the FAA Administrator personally flew the 737 MAX. Prior to his flight, the Administrator completed the same computer-based training and simulator flight evaluated by the Joint Operations Evaluation Board. While this flight is separate from the official FAA certification process, it satisfies a commitment made by the Administrator when he joined the agency.
  - Additionally, the FAA has carefully considered recommendations from the FAA Technical Advisory Board, Joint Authorities Technical Review, National Transportation Safety Board, and the Special Committee's Review of the FAA's Aircraft Certification Process, as well as the Lion Air 610 Final Accident Report published by the Indonesia Komite Nasional Keselamatan Transportation.

### What needs to be done

- The FAA continues to follow a thorough process rather than a set timeline for returning the 737 MAX to revenue service. The re-certification of the MAX has made significant progress and the following actions remain for return to service:
  - Publish Final Flight Standardization Board Report
  - Final design documentation and Technical Advisory Board Report
  - Publish an updated Boeing 737 MAX Master Minimum Equipment List

- Publish Final Rule (Airworthiness Directive)
  - Rescind FAA grounding order for U.S. domestic airplanes
  - FAA issuance of airworthiness certificates and export certificates of airworthiness for all new 737 MAX airplanes
  - Approve training programs for all part 121 operators
- As noted above, the FAA is carefully considering recommendations from advisory boards, special committees and reports, and is working on implementation efforts for each. Some recommendations have near-term significance, while others may have more broad-based implications for our approach to safety.
  - The FAA is awaiting the final results of the Department of Transportation Office of the Inspector General audit to compile an objective and detailed factual history of the activities that resulted in the certification of the 737 MAX. Once we receive the results, we will carefully review all recommendations to determine appropriate action.
  - Any recommendations associated with the return to service of the 737 MAX will be addressed prior to ungrounding the aircraft and return to revenue service. The FAA is committed to evaluate recommendations for future regulatory and policy upgrades that may further improve flight crew training and operational suitability of aircraft design.

## Enhancing FAA's oversight of aircraft certification processes

### Why this is a challenge

Expert reviews of the 737 MAX certification and the FAA's internal analyses have highlighted a need to enhance the FAA's oversight of the aircraft certification process, and review the work of FAA's human factors technical specialists. Advancements in aircraft automation have contributed to an unprecedented level of safety in our domestic aviation system. However, these tragic accidents reaffirm the importance of considering human factors and the interface between aircraft pilots and automated systems during certification. These improvements will move us toward a more integrated approach to aircraft certification that further improves safety.

## Progress in meeting the challenge

### Safety Management Systems

- The FAA believes the integration of safety management principles into design and manufacturing processes will support a systems approach that strengthens risk management interfaces and feedback loops between design, manufacturing, operation, and maintenance.
- To this end, FAA initiated a rulemaking to mandate Safety Management Systems (SMS) for key aviation sectors, including design and manufacturing organizations. We will seek broad input from industry stakeholders and our international regulatory partners to build better connections and interrelationships with the existing mandatory SMS of air carriers and voluntary SMS of other carriers, airports, manufacturers, and service providers. Until we complete the rulemaking, we will continue to foster and expand voluntary adoption of SMS in design and manufacturing.

### Enhancing Safety Oversight

- The FAA published the Integrated Oversight Philosophy (IOP) in June 2017, which provides foundational principles that each FAA oversight program must adopt to evolve safety oversight. The objectives of the IOP are to enhance the risk methodology for oversight, enable cross-functional data sharing, integrate oversight planning and activities, and expand the use of voluntary safety programs. The IOP provides guiding objectives as we enhance the oversight practices of aircraft certification.
- Part of this effort includes establishing an FAA-recognized system for showing compliance (called a compliance assurance system, or CAS) with a commensurate oversight system. Under the umbrella of the Safety Oversight and Certification Aviation Rulemaking Committee, the FAA created a CAS work group tasked with establishing processes to provide confidence that all applicable certification requirements for design approvals are met. The FAA believes that the combination of CAS and SMS is pivotal to the enhancement of safety oversight. The coupling of the compliance oversight and risk identification processes established by CAS with the comprehensive and integrated approach to managing risk and assuring performance established by the FAA will enhance safety oversight across the certification process.

### Organization Designation Authorization

- 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 and demonstrated capability of the organization. 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 FAA.
- The FAA has several initiatives underway as part of our efforts to reform and improve the ODA program. We have developed these initiatives based on: 1) the Congressional mandates in the FAA Reauthorization Act of 2018; and 2) recommendations from the Office of Inspector General 2015 audit, the Joint Authorities Technical Review, and the Special Committee on Aircraft Certification, following the grounding of the Boeing 737 MAX.
- The FAA Reauthorization Act of 2018 [Sec 212(b)] mandated establishment of a centralized office to be known as the ODA Office, within the Office of Aviation Safety, to oversee and ensure the consistency of the FAA's audit functions under the ODA program. The FAA temporarily established the office within its Aircraft Certification Service in March of 2019.

### Workforce Development

- The FAA knows that enhancing our current and future workforce requires investing in them. The FAA has identified the need for additional personnel with human factors (human/machine operational interface) and systems engineering knowledge, and requested these additional resources in our FY 2021 budget request.
- In 2020, we updated the Aviation Safety Engineer competencies, and in 2021 plan to review/update the Aviation Safety Inspector competencies to emphasize the need for systems thinking and risk-based decision-making.

## What needs to be done

### Organization Designation Authorization

- Once approved by Congress, Aviation Safety will re-align this office directly under the Associate Administrator for the Office of Aviation Safety. The FAA has also committed to funding 13 new positions for the ODA office.

### Enhancing Data Integration and Sharing

- To improve our human factor capabilities, and ultimately our certification processes, we will establish more robust feedback loops between the certification process and the operational environment. Enhancing current data systems to promote data integration and sharing will assure the feedback loops between operations and maintenance and design and manufacturing flow seamlessly.

## Balancing collaboration and enforcement through FAA's Compliance Program

### Why this is a challenge

To maintain the highest level of safety, FAA must strike an effective balance between collaboration and enforcement when overseeing critical air carrier safety programs. FAA's Compliance Program emphasizes the agency's preference for collaborating with air carriers through education and training over penalizing carriers to address discrepancies. The Compliance Program calls for FAA to work with air carriers to address the root causes of violations of safety regulations rather than imposing enforcement actions—a change in the way FAA and the airlines previously addressed compliance and safety issues. A key challenge the agency faces is striking a balance between collaboration and enforcement and accurately assessing whether an air carrier is willing and able to correct its deficiencies.

### Progress in meeting the challenge

- The FAA provided published guidance concerning this challenge in several public documents, including:
  - FAA Order 8000.373A, Paragraph 4
  - FAA Order 2150.3C, Chapter 5

- In addition, the Flight Standards and Aircraft Certification offices within Aviation Safety have developed guidance specific to their safety oversight responsibilities.
- The FAA provided training courses to its employees during the initial implementation of the Compliance Program. One such course, the FAA Compliance Philosophy Briefing, introduced the FAA's new Compliance Philosophy as the overarching guidance for implementing the FAA's strategic safety oversight approach to meeting the challenges of today's rapidly changing aerospace system. Each program office within Aviation Safety is also responsible for developing training material specific to their employees.
- The Flight Standards Service Safety and Compliance Team continues to conduct site visits to Safety Assurance offices (i.e., Flight Standards District Offices and Certificate Management Offices) to provide briefings on the Compliance Program. The team has conducted over 70 such visits to date.
- Deployed compliance and enforcement actions within the Aircraft Certification Service, which will support standardization and the ability to better track issues to ensure effective corrective actions.

### What needs to be done

- In accordance with recent U.S. Government Accountability Office recommendations, the FAA will complete the following activities:
  - Create both an Executive Council and a Steering Committee to oversee the use of the Compliance Program across all program offices listed in Order 8000.373A. This structure will allow for the necessary information exchange between the FAA executives and staff personnel on any planned, ongoing, and completed items regarding the FAA-wide oversight of the Compliance Program.
  - Conduct an evaluation of the Compliance Program to assess its effectiveness in meeting its goals. The results of the evaluation will be provided to the Administrator and will include recommendations to improve the effectiveness of the Compliance Program to ensure the highest levels of aviation safety.
- The FAA will initiate development of a Recurrent Compliance and Enforcement course, which will be

required for all Aircraft Certification Service personnel with oversight duties and responsibilities.

- Due to delays in FY 2020 caused by COVID-19, these activities are now scheduled for FY 2021:
  - Initiate a comprehensive revision to the Flight Standards Service’s Safety and Compliance course and the Enforcement Procedures course. The updated training materials will incorporate collected feedback to aid in balancing the appropriate response from FAA.
  - Initiate development of a Flight Standards Service Recurrent Safety and Compliance course that will be required for all personnel with investigative duties and responsibilities.

## Overseeing air carriers’ new systems for managing safety risks

### Why this is a challenge

The FAA’s Southwest Airlines Certificate Management Office (CMO) did not perform in accordance with existing guidance by allowing 88 aircraft (the “Skyline” aircraft) to enter service without the comprehensive conformity inspection required for used aircraft. Airlines use a conformity process to verify their aircraft conform to federal rules for type design and are configured to approved operations.

Additionally, the CMO at times did not perform in accordance with existing guidance that assures airlines use proper weight and balance calculations pre-flight. Southwest Airlines had weight and balance inaccuracies and missing maintenance requirements.

Once FAA leadership became aware of these issues, the agency took or oversaw various actions to address the safety matters articulated in the DOT’s Office of the Inspector General (OIG) draft report. On February 11, 2020, the DOT OIG published its report titled “FAA Has Not Effectively Overseen Southwest Airlines’ Systems for Managing Safety”. The OIG’s report contained 11 recommendations for the FAA.

### Progress in meeting the challenge

- To date, the FAA has closed one recommendation on “ensuring Southwest Airlines complies with regulatory requirements that the 88 previously owned aircraft conform to U.S. aviation standards.”

### What needs to be done

- For the recommendation on “ensuring Southwest Airlines complies with regulatory requirements to provide accurate weight and balance information to pilots, or grant an exemption that justifies the non-compliance being in the public interest”, the FAA plans to:
  - Have the FAA’s Southwest Airlines CMO develop an action plan to conduct intensive surveillance and review of the approved Southwest Airlines Performance Weight and Balance Program (in progress).
  - Create a System Analysis Team with Southwest Airlines personnel working collaboratively with the FAA’s Southwest Airlines CMO personnel to identify and address root causes of compliance failures (in progress).
  - Monitor the corrective actions in accordance with the Performance Weight and Balance Program recommendation.
- For the recommendations on “retraining inspectors at the local oversight office for Southwest Airlines on the purpose and proper use of the Voluntary Disclosure Reporting Program,” and “training managers and inspectors of the local oversight office on their roles and responsibilities to work with Southwest Airlines for root cause analysis,” the FAA plans to:
  - Document and complete on the job training in compliance with current guidance. Training includes a review of existing courses and pertinent sections of FAA Order 8900.1; presentations and briefings from FAA Policy/Program Offices/Branches on the related guidance and any changes/updates that have occurred; and scenario-based case studies.
- For the recommendations on “enhancing management controls to ensure designated airworthiness representatives comply with established procedures to verify that aircraft conform to U.S. airworthiness standards” as well as “developing a management control to ensure

that designated airworthiness representatives verify the completeness and accuracy of maintenance records, and do not rely on air carrier-provided summary data to make airworthiness determinations,” the FAA plans to:

- Mitigate the immediate safety concern by issuing a notice that requires Designated Airworthiness Representatives (DAR) to complete FAA Form 8100.1, Aircraft Conformity Inspection Record. The notice will also require the DAR to forward the record to their FAA Managing Specialist (which is the DAR’s FAA point of contact and provides oversight of DAR activities) for inclusion into the aircraft records. This action will provide the FAA greater clarity in how each DAR makes airworthiness determinations.
  - Enhance DAR training by incorporating the requirements contained within the notice into DAR initial and recurrent training.
  - Update FAA Order 8130.2J to include the requirements outlined within the Notice.
- For the recommendation on “completing a compliance review of other certificates issued by the designated airworthiness representatives used by Southwest Airlines,” the FAA plans to:
    - Complete a compliance review of other U.S. Standard Airworthiness Certificates for transport category aircraft issued by the DARs involved in the Southwest Airlines ‘Skyline’ project aircraft.
  - For the recommendation on “training inspectors on FAA’s process to provide feedback on designated airworthiness representatives when corrective actions are needed, and provide inspectors access to the system used to provide feedback,” the FAA plans to:
    - Reinforce Aviation Safety Inspector knowledge of the process contained within the Designee Management System (DMS) to provide feedback on DAR performance to the Managing Specialist through the publication of the notice referenced in the earlier recommendations on management controls.
    - Enhance awareness of the ability of all Aviation Safety Inspectors to access DMS.
    - Encourage the aviation community to provide feedback to any Managing Specialist on the performance of any DAR.

- For the recommendations on “developing and implementing a management control to ensure air carriers and inspectors do not use Safety Management Systems as a substitute for regulatory compliance” and “developing and implementing guidance on how to evaluate air carrier safety risk assessments to ensure the carrier has performed a comprehensive analysis, identified root causes, and established appropriate corrective actions,” the FAA plans to:
  - Update the Instructor Guide courses “SMS Practical Application Workshop” and “SMS Continued Operations Oversight”.
  - Provide training on 14 CFR part 5, Subpart C SRM applications.
- For the recommendation on “developing and implementing inspector guidance on how to evaluate air carrier safety culture and how it should be factored into oversight decisions,” the FAA plans to:
  - Develop a safety culture assessment tool.

## Sustaining and modernizing the En Route Automation Modernization (ERAM) system while integrating new capabilities

### Why this is a challenge

The FAA continues to sustain and modernize the En Route Automation Modernization system while integrating new capabilities.

### Progress in meeting the challenge

- The FAA continued to integrate new capabilities and external programs such as Data Communications and Space-Based Automatic Dependent Surveillance – Broadcast (ADS-B) into the ERAM platform. To achieve this, FAA utilized the ERAM strategic release planning process and multi-year integrated schedule to support pre-planned software releases. This ensured that both ERAM sustainment and Data Comm deployment schedules did not conflict.
- The FAA completed the following Key Milestones in FY 2020:

- ERAM Sustainment 3 (S3) – Completed handoff to Integration and Test team of enhanced data transfer technology for the EAF200 software build to form the foundation for planned ERAM Sustainment 3 equipment deployments.
- Space-Based ADS-B – Updated software to support an operational evaluation at Miami Air Route Traffic Control Center (ARTCC).
- Restrictions on travel and facility closures due to the COVID-19 public health emergency have resulted in delays in the delivery of several ERAM software releases. During the second half of FY 2020, software testing for ERAM was limited to the mission critical tasks of ERAM sustainment and mitigation of risks.
- Testing with participants from the field resumed in July 2020, and resulted in the national release of the EAE310 software on July 28, 2020. This action enabled the ability to mitigate potential shortages of ERAM spare parts. With this software, retrofit activity will begin at selected ARTCCs to replace the legacy D/A Position processors with Sustainment 2 hardware.
- Testing continued on the ERAM EAE330 release to identify the software fixes required to continue Sustainment 2 activities at key sites. The software is planned for release by the end of the first quarter of FY 2021.
- Planning for ERAM integration with other programs continued, with requirement definition and cost estimates being accomplished for Offshore Automation, Space Integration Concepts, Time Division Multiplex to Internet Protocol, and multiple Surveillance Broadcast Services Applications.

### What needs to be done

- ERAM Sustainment 2 (S2) – Complete installation of “Full” equipment components at three key ARTCCs. This activity is forecasted for the first quarter of calendar year 2021, but dependent on evolving COVID-19 restrictions for travel and site installation work.
- ERAM Sustainment 2 (S2) – Complete In-Service Decision, the final decision point in the acquisition process, for the “Full” deployment. This is forecasted for the second quarter of calendar year 2021, depending on evolving

COVID-19 restrictions. Complete installation at the three key sites is a precursor to In-Service Decision.

- ERAM Enhancement 2 (E2) – Deliver to key sites direct Transmission Control Protocol/Internet Protocol (TCP/IP) interface with NAVCanada capability in EAE400 software. This will advance the milestone for delivery of NAVCanada Automated Radar Handoff Capabilities in 2022. The TCP/IP interface software is a part of EAE410 build, tentatively scheduled for release the first quarter of calendar year 2021. The specific timeline for turn on of the capability at the key sites is to be determined pending evolving COVID-19 restrictions.

## Realizing the anticipated benefits of Automatic Dependent Surveillance-Broadcast (ADS-B) investments

### Why this is a challenge

According to the OIG, the “FAA still faces challenges in realizing the operational benefits and cost savings of ADS-B. These challenges include implementing procedures to take advantage of increased airspace capacity and implementing plans to reduce its radar infrastructure.”

### Progress in meeting the challenge

- The FAA continued collaboration with aviation users to continue progress on the aircraft equipage that enables maximum benefits from FAA’s NextGen investments. This includes addressing barriers to aircraft equipage and the need for low-cost avionics solutions. In response, the FAA offered rebates of \$500 to owners of fixed wing, single-engine piston aircraft to help offset the cost of equipping.
- Commercial U.S. carriers are now very near 100 percent equipped for aircraft in operation in controlled airspace. General Aviation operators that need regular access to that airspace are also largely equipped, with aircraft needing only occasional access continuing to equip.
- The FAA has had success with significant investment in the infrastructure, which interacts with the corresponding aircraft avionics to enable benefits. The ground infrastructure for Automatic Dependent

Surveillance – Broadcast (ADS-B) is complete, providing a more accurate, higher update rate for surveillance of aircraft.

- During FY 2020, the FAA completed the following actions to further enhance ADS-B benefits:
  - Enabled three Nautical Mile Separations using ADS-B within en route airspace at two of the 21 Air Route Traffic Control Centers (ARTCCs) that control high-altitude traffic.
  - In March 2020, completed initial integration of Space-Based ADS-B data within the Test and Training Environment at the Miami ARTCC.
  - Conducted an ADS-B In benefits study to help the airline industry understand the potential benefits of such future operations.
  - Deployed the ADS-B Deviation Authorization Pre-Flight Tool to support Air Traffic Control authorizations for operator equipment exceptions.
  - Continued radar divestiture analysis, safety risk management activities, and site outreach activities to potential candidates for radar divestiture, with the goal to identify two radars locations as sites for discontinuance.

### What needs to be done

- To protect our critical safety workforces during the COVID-19 public health emergency, the FAA has restricted access to many air traffic control facilities. These restrictions have suspended equipment and software installations, as well as the accompanying on-site training.
- Goals and milestones for the 2020 period that are delayed due to COVID-19 are as follows:
  - Further expansion of three Nautical Mile Separations using ADS-B within en route airspace beyond the first two ARTCCs.
  - Completion of Radar Divestiture Safety Risk Management Panels for the first two initial sites.

## Resolving obstacles to implementing new flight procedures and delivering benefits to airspace users

### Why this is a challenge

The FAA continues to modernize the national airspace system through the multi-billion dollar Next Generation Air Transportation System (NextGen) program. As envisioned, NextGen will provide safer, more efficient air traffic management by 2025. While it has implemented new capabilities, FAA still faces challenges in upgrading aging infrastructure, continuing NextGen deployment, and achieving intended benefits in a cost-effective manner.

### Progress in meeting the challenge

#### Addressing increased community concerns about aircraft noise

- The FAA continued ongoing communications as an effective community involvement practice, and pursued open dialogue in collaboration with local airports and communities.
- The FAA developed continuous and scalable community outreach programs and has built virtual capabilities for community engagement in response to the COVID-19 public health emergency. These capabilities establish a basis of communication and collaboration with local communities as we continue to work more effectively with airports to address our mutual challenges. These challenges include identifying and avoiding environmentally sensitive areas and collaborating with industry partners and air traffic control facilities to design instrument flight procedures that utilize advanced technologies.
- The FAA established community engagement officers and regional ombudsmen, and continues to accurately capture and document agency and public interactions. Metrics gathered are being used to more effectively tailor future responses to noise concerns and improve support of community outreach events and activities.
- Additional staffing for the environmental review, community involvement, and national airspace analytics teams were requested and approved among service centers. Western and eastern teams have each been approved for 10 additional positions. Some positions

were filled this year, with the remaining positions to be filled throughout FY 2021-22. Additional staffing will enable more thorough and timely responses to both Congressional-level inquiries and aircraft noise complaints.

#### Lack of automated decision support tools for controllers

- In coordination with industry partners such as Airlines for America, National Business Aviation Association, Aircraft Owners & Pilots Association, and Air Line Pilots Association, FAA evaluated tools and technologies that will provide automated spacing, sequencing, and separation of air traffic. This also increases efficiencies and adds additional safety protocols to the national airspace system.
- This effort is focused on implementing Trajectory-Based Operations (TBO), which includes Terminal Sequencing and Spacing, Time-Based Flow Management (TBFM), Integrated Departure and Arrival Capability, Adjacent Center Metering, and Performance-Based Navigation. TBFM standards, procedures and policy are being incorporated throughout the national airspace. TBFM is now deployed at 20 Air Route Traffic Control Centers (ARTCCs), 30 Terminal Radar Approach Control facilities (TRACONs), and 41 air traffic control towers.
- Accomplishments in the TBO Operating Areas include:
  - Denver TBO Operating Area: Deployed Adjacent Center Metering in January and again in June 2020. Deployed Denver International Airport Metroplex in March 2020. We continue to monitor the Denver ARTCC metering system for necessary changes or gaps.
  - Northeast Corridor TBO Operating Area: Worked on and tested the Philadelphia International Airport metering design with the adjacent ARTCCs and Philadelphia TRACON. Introduced change management activities to the Northeast Corridor facilities.
  - Atlanta TBO Operating Area. Deployed Adjacent Center Metering in July 2018 and deployed Integrated Departure and Arrival Capability in October 2019.
- The FAA continued implementing Integrated Departure and Arrival Capability, with installation at Denver Tower on September 30, 2020. The Integrated Departure and Arrival Capability system monitors departure demand, identifies slots in the overhead stream of traffic, and de-conflicts departures.

- While deployment occurred in some of the TBO Operating Areas, it has not been as robust as planned due to the COVID-19 public health emergency. The few deployments we have implemented have decreased the controller workload. We have postponed Integrated Departure and Arrival Capability because of limited access to facilities and the FAA Technical Center, which is necessary for testing systems and training the workforce before implementation.

#### Unclear terminology used by pilots and controllers for referring to flight paths

- The Air Traffic Control Handbook Revision Project was established to address the expeditious implementation of performance-based airspace operations pertaining to phraseology and procedures as described in FAA Order 7110.65, "Air Traffic Control." The following are some of the associated phraseology and procedure issues that are being addressed:
  - Reduction of Diagonal Separation for Parallel Dependent Approaches
  - Treat Go-Around/Missed Approach Ops as a Normal Departure
  - Expanding the Definition of Radar (Radar Contact/Contact Lost)
  - Reorganize Approach Clearance Differentiations
  - Tower Applied/Pilot Applied Visual Separation infrastructure
- The Mission Support Policy Directorate is tracking the processing and implementation of revisions identified by the Air Traffic Control Handbook Project Steering Committee referring to flight paths, although there have been no changes specified for the en route environment.
- An effort to expand the definition of radar to include other surveillance sources is underway, with the goal of completion by September 30, 2021.

#### Lengthy procedure amendment process

- The revised FAA Order 8260.43 was fully implemented in October 2019. Metrics were established to track and monitor the health of the new process. These metrics assist in identifying inefficiencies so they can be addressed,

and ensure cross-agency perspectives are considered when making the decision to invest in a given procedure.

- The Prioritization Team continued to meet monthly to assess system health and prioritize procedure development, based on FAA priorities and system capacity. The COVID-19 public health emergency has significantly reduced the FAA's capability to develop and publish procedures due to the reduced availability of subject matter experts in air traffic control facilities. COVID-19 also forced the FAA to reduce flight inspection missions by over 70 percent in an effort to safeguard the health of aircrews.
- The Prioritization Team, with guidance from the Instrument Oversight Committee, continued to focus on high-priority items to ensure resource deployment is focused on those priorities from the outset of the workflow. This prevents resources from being expended on developing procedures that are not considered a high priority.
- Upgrades to the FAA's design, evaluation, periodic review, and workflow tracking software systems are increasingly automating manual tasks, greatly reducing procedure development and maintenance costs. To this end, the Aeronautical Information Services Production Workflow System (APWS) was deployed to replace the old workflow automation system. APWS provides a more streamlined workflow by incorporating multiple systems into one.

### ***What needs to be done***

#### **Addressing increased community concerns about aircraft noise**

- Continue enhancement of virtual community engagement platforms and outreach.
- Continue efforts to hire and train environmental review, community involvement and national airspace analytic staff.
- Continue development of automated solutions for collection and analysis of community noise concerns.
- The noise portal, an on-line resource where noise-related complaints or inquiries are aired, will be released in FY 2021 to enhance response times to aircraft noise issues.

#### **Lack of automated decision support tools for controllers**

- Continue the deployment and implementation of traffic sequencing, metering, and/or merging and spacing automation tools to decrease controller workload and

promote use of Performance-Based Navigation procedures. The Performance-Based Navigation National Airspace System Navigation Strategy emphasizes the importance of automation tools that support the use of Performance-Based Navigation procedures. The next steps are:

- Denver TBO Operating Area: Continue refinement of Adjacent Center Metering and implement Integrated Departure and Arrival Capability, Terminal Sequencing and Spacing, Terminal Flight Data Manager (TFDM), and Data Communications (Data Comm).
  - Northeast Corridor TBO Operating Area: Continue Departure scheduling activities, with projected deployment by the end of calendar year 2022. We will continue to refine the en route metering system, deploy TFDM, and Data Comm.
  - Atlanta TBO Operating Area: Continue to refine the en route metering system, implement departure scheduling from Boston and New York ARTCCs, Hartsfield-Jackson Atlanta International Airport, and Charlotte Douglas International Airport. In addition, deploy TFDM and Data Comm at Charlotte Douglas International Airport.
- We will expand the Terminal Sequencing and Spacing tool to extend the metering and sequencing capability of TBFM into terminal airspace in the 2022/2023 timeframe (exact timeframe uncertain due to COVID-19).

#### **Unclear terminology used by pilots and controllers for referring to flight paths**

- Continue engagement in the Pilot Controller Procedures Systems Integration Workgroup to identify shortfalls in unclear terminology.

#### **Lengthy procedure amendment process**

- Further refine prioritization process and stakeholder collaboration.
- Improve Performance Based Navigation procedure development process.
- The Prioritization Team will continue to prioritize procedure development based on agency needs, with a focus on safety-related items. As capacity returns to normal post-COVID-19 volume, the Prioritization Team will continue to balance capacity with stakeholder needs.

## Auctioning off electromagnetic spectrum to finance and deploy new radars

### Why this is a challenge

Serving as the Lead Acquisition Agency for the Spectrum Efficient National Surveillance Radar (SENSR) program is a challenge because the FAA must manage a cross-agency team and the Spectrum Relocation Fund funding mechanism. Both of these FAA roles require strategic communication and engagement with various government stakeholders, such as the National Telecommunications and Information Administration (NTIA), Office of Management and Budget (OMB) and Federal Communications Commission (FCC).

### Progress in meeting the challenge

- The FAA's Joint Resources Council approved the SENSR Initial Investment Decision on March 31, 2020, contingent on policy-level support for the preferred alternative. The SENSR preferred alternative required policy-level changes to spectrum auction legislation and pre-auction funding.
- High-level officials from the FAA, Department of Defense and Department of Homeland Security requested the creation of the Policy Coordination Committee (PCC) in July 2020 to reach consensus on the viability of and the path forward for SENSR. The PCC includes executives from OMB, FCC, NTIA, National Economic Council, National Security Council, and the White House Policy Council. The PCC meetings occurred on July 22 and August 6.
- On July 22, the SENSR Joint Program Office received feedback that the program will not receive policy-level support to address the legislative constraints that stand in the way of implementing the SENSR program plan created by the three partner agencies. NTIA subsequently presented an alternate SENSR proposal (Re-packing Radar Frequency Assignments in the 1215-1390 MHz Frequency Range).
- On August 6, the PCC provided new direction to the SENSR program. It was agreed to by all parties that the SENSR Joint Program Office would conduct a six-month feasibility assessment of the NTIA proposal. Three primary activities define this assessment:
  - Retune feasibility assessment
  - Conduct market survey
  - Update program cost estimate

- Two FY 2020 milestones are no longer applicable:
  - Release Draft Screening Information Request by June 30, 2020. The FAA paused Screening Information Request-related acquisition activities while working with the Executive Steering Group, the Technical Panel, and PCC to define an acceptable path forward for the program, leading to the August PCC determination to redirect program activities.
  - Submit SENSR Spectrum Pipeline Plan update to the Technical Panel by September 30, 2020. The program did not require additional funds from the Spectrum Relocation Fund to complete the feasibility assessment outlined in the August PCC meeting.

### What needs to be done

- The next PCC meeting to review progress on the feasibility assessment is scheduled for November 2020.
- Complete feasibility assessment of the National Telecommunications and Information Administration's proposal by late February 2021.

## Addressing longstanding cybersecurity vulnerabilities and strengthening internal controls

### Why this is a challenge

Without Department of Transportation Office of the Chief Information Officer oversight to establish effective cybersecurity internal controls, DOT will continue to face challenges in reducing the risk of external cyberattacks or insider threats that may expose sensitive information and compromise the Department's safety mission.

### Progress in meeting the challenge

- FAA participated in the Department's Office of the Chief Information Officer (OCIO) program performance oversight and reviews of Operating Administrations' cybersecurity programs in February 2020.
- As part of the performance oversight review, FAA provided the OCIO with risk acceptance memos for FAA systems with expired Authority to Operate and updates to the Plan

of Action and Milestones reviewed for inaccurate data, missing information, and timely updates.

- The FAA regularly monitored and reported on security awareness and role-based training progress. As of August 31, 2020 FAA achieved:
  - 92 percent (of 95 percent required) compliance with annual security and privacy awareness training
  - 93 percent (of 100 percent required) compliance with role-based training for key information security personnel.
- The FAA has updated its common control provider catalog in the Departmental Cyber Security Assessment and Management system and issued memos to all Authorizing Officials of the common controls available to systems for inheritance.
- The FAA remediated 70 percent of the vulnerabilities with critical and high severity ratings identified on the high-impact systems. In addition, FAA continues to address High Value Risks in Internet Protocol systems within 30 days, under the oversight of the FAA Cybersecurity Steering Committee.
- The FAA has submitted Risk Acceptance memos for FAA systems that have expired authorizations and validated that correct authorization status and dates are reflected in the Departmental Cyber Security Assessment and Management system.

### What needs to be done

- FAA will continue to address the challenge of improving management oversight by:
  - Establishing and maintaining authorized points of contact within each organization for training status reports.
  - Including personnel lists to identify managerial alignment inaccuracies.
  - Identifying accounts with no managerial data and work with Learning Management System administration to populate those data elements.
  - Encouraging agency management to utilize the Human Capital System process to properly update accounts with accurate management data.
- These efforts should improve agency compliance requirements for security awareness and role-based training.

## Implementing congressionally mandated aviation cybersecurity initiatives to protect flight-critical systems

### Why this is a challenge

Protecting systems from rapidly evolving cyber-based threats in an expanding environment is a challenge that requires the cooperation of aviation industry stakeholders, airlines, airports, and manufacturers.

### Progress in meeting the challenge

- To address the recommendations provided by the Office of Inspector General (OIG) within the report “FAA Has Made Progress but Additional Actions Remain To Implement Congressionally Mandated Cyber Initiatives” (Report No. AV2019021, March 2019):
  - Aviation Safety (AVS) identified target dates to address the four deferred recommendations made by the Aviation Rulemaking Advisory Committee Aircraft Systems Information Security Protection (ASISP) Working Group. These target dates were included in the AVS Strategic ASISP Plan to address the Working Group’s four deferred recommendations to enhance aircraft systems cybersecurity. The OIG closed out this recommendation in October 2019.
  - The Cyber Security Risk Model Strategy and Plan has been updated to outline a four-year approach for a fully integrated life cycle methodology to effectively defend against cybersecurity threats and manage its cybersecurity risk on a continual basis. The OIG closed out this recommendation in November 2019.
  - NextGen updated the FAA’s Cyber Research & Development (R&D) Plan. The strategy identifies the research required to support the detection, response, and resilience to cyber-attacks on the FAA and aviation infrastructure. The Plan outlines the next 5-year research strategy (i.e., ongoing and prospective R&D activities relative to the goals and objectives specified in the Cybersecurity Strategy) across budget type, whether identified directly as cyber product or as part of a larger effort. The OIG closed out this recommendation in February 2020.

### What needs to be done

- The FAA continues to work with the OIG to ensure closure of the three remaining recommendations from their March 2019 report and has submitted closure requests to OIG for their consideration.
- In response to the OIG's September 2020 report "FAA and Its Partner Agencies Have Begun Work on the Aviation Cyber Initiative and Are Implementing Priorities" (Report No. AV2020043), the FAA concurs with OIG's recommendation that FAA, in consultation with its Aviation Cyber Initiative (ACI) partners, identify the resources needed to meet the current schedule for achieving ACI's remaining priorities and how those resources should be allocated, and revise the current schedule, as necessary. The FAA plans to implement the recommendation by December 31, 2020.

## Safely integrating Unmanned Aircraft Systems and the commercial space industry into the national airspace system

### Why this is a challenge

The FAA is responsible for the safety and security of all aircraft in the national airspace, including more than 1.7 million registered drones. In order to safely integrate Unmanned Aircraft Systems (UAS) and the commercial space industry into the nation's airspace system, the FAA must resolve technological and regulatory challenges such as how to identify drone ownership while in flight – called Remote ID – as well as preparing for a dynamic and rapidly growing set of future commercial space missions.

### Progress in meeting the challenge

#### **To implement provisions for recreational flyers, the FAA has:**

- Modified our Low Altitude Authorization and Notification Capability and our website DroneZone to allow recreational flyers to obtain airspace authorizations more quickly.
- Issued authorizations for fixed sites. These specific locations will allow recreational flyers to fly in controlled airspace at altitudes below those presented in the UAS Facility Maps.

- As required by the FAA Reauthorization Act of 2018, the FAA is developing a UAS aeronautical knowledge and safety test for recreational flyers. To this end, the FAA issued a Request for Information to develop a relationship between FAA and third party entities (commercial, non-profit, academic, and others) who can provide recommendations on a knowledge test's design and administration, as well as support initial deployment of the test.
- Conducted a safety risk management panel for UAS operations over 400 feet above the ground.
- Developed the knowledge test's administration requirements and Memorandum of Agreements that are in the final stages of the review process.
- Started developing the knowledge test and plans to implement the test using initial test administrators by the end of the first quarter FY 2021.
- Developed an Advisory Circular that contains guidance on community-based organizations as required by the FAA Reauthorization Act of 2018. It is currently under review by the Department of Transportation.

#### **To create a robust system for safety data, the FAA has:**

- Developed, in collaboration with NASA, data sharing mechanisms, including de-identification and protection requirements. De-identification allows stakeholders to contribute safety data without fear of reprisals or loss of proprietary data. This data then helps identify risks and evaluate the effectiveness of proposed solutions.
- Initiated and led a data integration effort involving UAS data stakeholders from across the FAA to determine inconsistencies in existing definitions, gaps in data collections, and unclear uses for some required data elements. The effort standardized the definitions, closed the gaps, developed the needed traceability between data collected and its uses, and explored several hosting solutions to increase efficiency and effectiveness in the most budget-friendly method possible. The effort is synchronizing UAS data across the FAA, ensuring that each office receives the necessary data for decision-making regarding safety and integration of drones into the nation's airspace.

**To resolve technological and regulatory challenges such as Remote ID, the FAA has:**

- Issued the Notice of Proposed Rulemaking and received over 53,000 public comments. The final rule has cleared the FAA and is currently in review at DOT as well as concurrently undergoing interagency coordination.
- Launched the Remote ID implementation team in October 2019 and developed an initial breakdown of work activities.
- Launched the Remote ID implementation steering committee in June 2020 to help executive management oversee and coordinate the implementation of the Remote ID rule requirements across FAA.
- Considered how manned aviators can partake in Remote ID efforts, by issuing a Request for Information whose comments were received in March 2020.

**With respect to the commercial space industry, the FAA has:**

- Completed development of time-based launch/reentry procedures to more efficiently manage air traffic affected by and in the vicinity of launch/reentry activity.
- Completed development of dynamic launch/reentry windows. The operational triggers will provide greater efficiencies for users of the nation's airspace.
- Completed software development for Space Data Integrator Phase 1 Minimum Viable Product. This tool will receive and distribute launch and reentry data to allow for improved situational awareness and improved airspace management decision making.

**What needs to be done**

**To implement provisions aimed at recreational flyers, in FY 2021 the FAA will:**

- Complete the review process and finalize knowledge test administration requirements and Memorandum of Agreements.
- Develop policy for fixed sites and sanctioned events that are above the current authorized altitudes.
- Pending completion of DOT review, publish the Advisory Circular for comment and finalize guidance.
- Implement the knowledge test by December 31, 2020.

**To create a robust system for safety data, the FAA will:**

- Publish in the first quarter of FY 2021 the updated Advisory Circular 00-46F, which governs the aviation safety reporting program, to extend protections to the unmanned community.
- Collaborate with the Unmanned Aircraft Safety Team to promote the Aviation Safety Reporting System to the UAS community after Advisory Circular 00-46F is published.
- Work with partners in the Integration Pilot Program and the Partnership for Safety Program to develop a robust system for obtaining, tracking, and analyzing UAS safety data, including program data that is regularly submitted to the FAA, and operational data or reports as required by the operational provisions of waivers granted. Expected completion is the first quarter of FY 2021.

**To resolve technological and regulatory challenges such as Remote ID, the FAA will:**

- Issue the final rule for Remote ID in December 2020.
- Continue to coordinate and execute items on the Remote ID implementation schedule.
- Issue the final rule for Operations Over People in December 2020
- Continue to hold monthly Unmanned Traffic Management update meetings with stakeholders, FAA executives, and NASA.
- Complete the Unmanned Traffic Management Implementation Plan and deliver it to Congress in the first half of calendar year 2021.

**With respect to the commercial space industry, the FAA plans to:**

- Conduct industry outreach with airline stakeholders to educate them on time-based launch/reentry procedures and notices to airmen that are used to notify the aviation community of launch and reentry operations. While originally planned for FY 2020, due to COVID-19, airlines have been unable to schedule training.

## Supporting R&D and reshaping the workplace to meet future needs

### *Why this is a challenge*

The Office of the Inspector General's (OIG) recent examination of the Department's Research and Development (R&D) efforts identified challenges concerning DOT/FAA's use and management of other transaction agreements (OTAs). These agreements are used to engage outside parties in cooperative R&D. When awarding OTAs, FAA did not consistently analyze OTAs for conflicts of interest, perform cost-benefit analyses that examined facility utilization, or monitor cost sharing when using this innovative mechanism. As a result of these weaknesses, the OIG concluded that the FAA missed opportunities to realize potential cost savings.

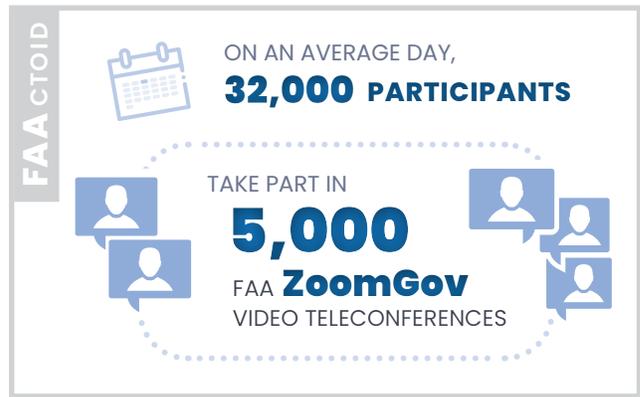
The Inspector General specifically noted weaknesses with respect to a large OTA with Embry Riddle Aeronautical University (ERAU) to conduct collaborative NextGen research with members of the aviation industry and operate the NextGen Florida Test Bed (FTB). They recommended development of a business case for new or modified OTAs that include the potential for competition, a cost-benefit analysis that examines facility utilization (whether onsite or via remote access), and potential for cost sharing. They likewise recommended that FAA follow DOT's cybersecurity policy, and track access and usage of OTA-covered information systems at the FTB.

### *Progress in meeting the challenge*

- The FAA established a business case for the award of a new OTA to ERAU. The business case contains an updated analysis for the location of the FTB, investigating the costs associated with moving the FTB research facility to a new location under new management or keeping it at the existing site.
  - The business case clearly identified that moving the FTB to another location would come at great taxpayer expense, and would result in significant time delays, during which NextGen research at the FTB would need to cease.
  - In terms of facility management, the business case noted that ERAU is already located onsite at the FTB, resulting in lower overhead costs and other significant advantages, including the use of the low-cost university workforce, while educating the student body — our future aviation experts — about Next Generation Air Traffic Control.
- The FAA continues to track the effectiveness of the FTB as part of the FAA's yearly business case review. The FAA reports on the use of the FTB by mission partners and tracks usage statistics in the yearly business case review. In addition, the FAA began to improve its tracking of facility utilization by tracking remote access to the FTB.
- In terms of cost sharing, significant industry contributions continue to be made by private organizations bringing their capabilities to the FTB for evaluation and integration. As part of this effort, the FAA continues to conduct "Industry Days," that solicit participation from industry organizations in NextGen research projects on cost-sharing programs, which mutually benefits the FAA and industry alike.
  - Testing and integrating existing capabilities with operationalized FAA and new NextGen infrastructure resulted in major risk reduction for the FAA, from both schedule shortening and taxpayer cost-saving/cost-avoidance perspectives.
  - In addition, the FAA continues to realize incremental milestones toward the full implementation of Trajectory Based Operations, one of the cornerstone tenets of NextGen. Trajectory Based Operations is the FAA's method of strategically planning, managing, and optimizing flights throughout the operation. Aircraft will use time, rather than less efficient miles in trail, which allows the aircraft to fly more precise flight paths, increasing predictability, flexibility, and throughput.
- In order to address the OIG recommendation that FAA follow DOT's cybersecurity policy, and track access and usage of OTA-covered information systems, the FAA implemented a robust automated process used by ERAU at the FTB to generate activity logs. This process logs key activities such as connects, disconnects, access rejections, data flow creations, Network Address Translation events, etc., in a recursive onboard buffer. This information is voluminous and chronological. Each logged event is recorded as they occur. Cisco Virtual Private Network Filter commands were created on the FTB firewall to extract relevant types of Virtual Private Network connections and Virtual Private Network disconnections. This information is dumped into a log file on a syslog server.

**What needs to be done**

- The FAA will expand, extend, and institutionalize standardized processes for the management, execution monitoring, and reporting of OTA activities within the R&D arena.
- The FAA will initiate a standard in-take process to serve as a common point-of-entry for coordination of new OTAs within the R&D sphere. This process will ensure that new R&D OTAs address the recommendations associated with this Management Challenge for all applicable future procurements, while simultaneously meeting the requirements of OTA Guidance stipulated by AFN.



Above: Passengers at LAX Airport waiting in line for check-in in summer 2020. Photo by Stella Levi/iStock.



Left: A social distancing sign in an empty Terminal B at Los Angeles International Airport in spring 2020. Photo by Jorge Villalba/iStock



Below: Airplanes idle at Fort Lauderdale-Hollywood International Airport due to the public health emergency. Photo by Felix Mizioznikov/iStock.