U.S. DEPARTMENT OF TRANSPORTATION
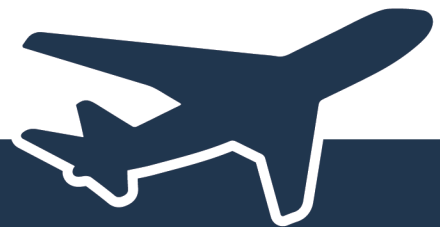# OFFICE OF INSPECTOR GENERAL

FAA Can Increase Its Inspector Staffing Model's Effectiveness by Implementing System Improvements and Maximizing Its Capabilities

FAA

FAA Can Increase Its Inspector Staffing Model's Effectiveness by Implementing System Improvements and Maximizing Its Capabilities

Mandated by the Federal Aviation Administration (FAA) Reauthorization Act of 2018

Federal Aviation Administration | AV2021034 | August 11, 2021

What We Looked At

Much of the Federal Aviation Administration's (FAA) safety oversight work is performed by its aviation safety inspector workforce, whose responsibilities include overseeing the maintenance practices of air carriers and other operators, certifying the airworthiness of new aircraft, and monitoring the work performed by individual and organizational designees. To help determine its future needs, FAA uses its inspector staffing model to produce annual forecasts of up to 10 fiscal years of inspector staffing levels. The FAA Reauthorization Act of 2018 directed FAA to update its safety-critical staffing model and our office to conduct an audit to determine the staffing model's assumptions and methodologies and whether it accounts for FAA's authority to fully use designees, which handle certification reviews and approvals on FAA's behalf. Our audit objectives were to (1) assess the changes FAA made to update the inspector staffing model, (2) review the assumptions and methodologies the model uses to predict the number of aviation safety inspectors FAA needs to meet its current and future oversight responsibilities, and (3) determine how FAA's model accounts for the use of designees.

What We Found

Since 2013, FAA has taken constructive steps to improve the model but has not taken substantive action on three recommendations from the National Research Council, including developing performance measures to assess the accuracy of the model's staffing estimates. Further, FAA has yet to implement two new models that would reflect organizational changes, and only uses the model to produce a single, national inspector staffing figure. Finally, the model accounts solely for the time inspectors spend overseeing individual and organizational designees, not the work these outside parties perform on FAA's behalf or may perform in the future.

Our Recommendations

We made seven recommendations to improve the accuracy of FAA's inspector staffing projections and enhance the capabilities of the staffing model. FAA concurred with five of our seven recommendations and partially concurred with two. We consider six recommendations resolved but open, pending completion of planned actions and have asked FAA to reconsider its action for one partially concurred recommendation.

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U.S. DEPARTMENT OF TRANSPORTATION
OFFICE OF INSPECTOR GENERAL

Memorandum

Date: August 11, 2021

Subject: ACTION: FAA Can Increase Its Inspector Staffing Model's Effectiveness by Implementing System Improvements and Maximizing Its Capabilities | Report No. AV2021034

From: Matthew E. Hampton
Assistant Inspector General for Aviation Audits

To: Federal Aviation Administrator

As part of its safety oversight mission, the Federal Aviation Administration (FAA) monitors nearly 285,000 registered manned aircraft, 5,400 aircraft operators, and over 1,500 approved manufacturers to ensure compliance with aviation safety laws and regulations. Much of this work is performed by the Agency's aviation safety inspector workforce, whose responsibilities include overseeing the maintenance practices of air carriers and other operators, certifying the airworthiness of new aircraft, and monitoring the work performed by individual and organizational designees.[1] In its safety workforce plan, FAA stated that it had requested 4,240 inspectors for fiscal year 2021 to conduct these oversight activities.

To help determine its future needs, FAA uses its inspector staffing model,[2] adopted in October 2009, to produce annual forecasts of up to 10 fiscal years of inspector staffing levels. The model was adopted following recommendations from a 2006 National Research Council (NRC) study[3] that found FAA had an ineffective method for identifying how many safety inspectors it needed and where they were needed most.

To address this critical function, section 303 of the FAA Reauthorization Act of 2018[4] directed the Agency to update its safety-critical staffing model to determine the number of aviation safety inspectors it needs to fulfill its safety

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[1] Designees are individuals and organizations in the aviation industry authorized to conduct examinations, perform tests, and issue approvals and certificates on FAA's behalf.
[2] FAA's inspector staffing model is formally known as the Aviation Safety Staffing Tool and Reporting System or ASTARS.
[3] National Research Council (NRC), *Staffing Standards for Aviation Safety Inspectors*, September 2006.
[4] Pub. L. No. 115-254 (2018).

oversight mission. The act also directed our office to conduct an audit to determine the staffing model's assumptions and methodologies and whether the model accounts for FAA's authority to fully use designees. In November 2019, FAA informed us that the model had been updated in accordance with section 303.

Accordingly, our audit objectives were to (1) assess the changes FAA made to update the inspector staffing model, (2) review the assumptions and methodologies the model uses to predict the number of aviation safety inspectors FAA needs to meet its current and future oversight responsibilities, and (3) determine how FAA's model accounts for the use of designees.

We conducted this audit in accordance with generally accepted Government auditing standards. Exhibit A details our scope and methodology. Exhibit B lists the entities we visited or contacted.

We appreciate the courtesies and cooperation of Department of Transportation (DOT) representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-0500 or Robin Koch, Program Director, at (404) 562-3770.

cc: The Secretary
       DOT Audit Liaison, M-1
       FAA Audit Liaison, AAE-100

Background

Aviation safety inspectors are FAA's frontline workforce who ensure that aircraft operators, manufacturers, and maintenance providers comply with aviation safety laws and regulations. Most inspectors are employed within two offices of the Agency's Aviation Safety (AVS) organization:

- **Flight Standards** oversees various segments of the aviation industry, such as aircraft operators, and develops rules and guidance for operations, maintenance, avionics-related issues, and designee oversight.

- **Aircraft Certification** administers and enforces regulations around the design, production, and airworthiness of aviation equipment (e.g., engines, propellers, and aircraft) and oversees approval holders and designees.

As shown in table 1, FAA requested 4,240 inspectors for Flight Standards and Aircraft Certification in fiscal year 2021, with the vast majority (3,947 or over 93 percent) working in Flight Standards.

Table 1. AVS Inspector Staffing Levels, FY 2019–FY 2021[a]

Function	FY 2019 Actual	FY 2020 Enacted	FY 2021 Requested
Flight Standards	3,800	3,941	3,947
Aircraft Certification	236	286	293
Total[b]	**4,036**	**4,227**	**4,240**

[a] Staffing levels are based on the number of full-time positions at the end of the fiscal year.

[b] Totals do not include inspectors who work on air traffic safety oversight activities, which FAA estimates will be 79 inspector positions in fiscal year 2021.

Source: FAA

In 2003, Congress directed NRC to conduct a study of the assumptions and methods FAA used to estimate inspector staffing standards and include a review of the Agency's previous staffing model. The resulting 2006 report found several deficiencies with the previous model, including an inability to predict the consequences of staffing shortfalls or account for some important factors affecting inspector workload, such as managing designees, and the exclusion of validated data. NRC recommended that FAA completely overhaul its staffing model and ensure that, in addition to the attributes above, the new model had the ability to project the necessary number and locations of inspectors to sustain system performance.

In response, FAA contracted with the John A. Volpe National Transportation Systems Center (Volpe) to design a new staffing model, which the Agency introduced in October 2009. However, in 2013 we reported[5] that there were several gaps between the model and the NRC recommendations, including the lack of field office buy-in on the model's estimates and the absence of performance measures that could determine the model's effectiveness at estimating inspector staffing needs. In addition, the new model for Flight Standards was faulty, unreliable, and contained incomplete, inaccurate, and outdated data. As a result, FAA could not rely on it to determine the number of inspectors needed or their placement at field locations. We recommended that the Agency conduct a comprehensive assessment of the staffing model based on the NRC recommendations. In response, FAA commissioned a study[6] in 2013 that showed its new model fully incorporated only 9 of the 25 NRC recommendations and that FAA had not taken any action on 7 recommendations.

In 2015, we reported that while the Agency used the new staffing model to help determine overall inspector staffing needs for overseeing its Organization Designation Authorization (ODA) program,[7] it did not use the model to forecast staffing needs at the field certification office and oversight team levels.[8] In addition, the model did not include detailed ODA data on important workload drivers such as a company's size and location, the type of work performed, past performance, and project complexity and volume.

Results in Brief

While FAA has updated the model to address several weaknesses, it has not implemented key changes that would improve inspector staffing projections.

Since 2013, FAA has taken steps to improve its staffing model and has fully implemented 16 of the 25 NRC recommendations by taking constructive steps to improve the model's data, enhance the model's software so it can be easily modified, and simplify the model's formula to more easily calculate future inspector activities. FAA has also partially implemented six recommendations

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[5] *FAA Lacks a Reliable Model for Determining the Number of Flight Standards Safety Inspectors It Needs* (OIG Report No. AV2013099), June 20, 2013. OIG reports are available on our website: https://www.oig.dot.gov/.
[6] Grant Thornton LLP, *ASTARS Gap Analysis Study: Comparison of the AVS Staffing Model for Aviation Safety Inspectors to the National Academy of Sciences' Recommendations Final Report*, September 20, 2013.
[7] FAA created the ODA program in 2005 to standardize its oversight of organizational designees (e.g., aircraft manufacturers) that have been approved to perform certain functions on the Agency's behalf, such as determining compliance with aircraft certification regulations.
[8] *FAA Lacks an Effective Staffing Model and Risk-Based Oversight Process for Organization Designation Authorization* (OIG Report No. AV2016001), October 15, 2015.

related to such issues as validating the model and ensuring that it includes relevant inspector workload data. However, the Agency has not completed action on three recommendations, including implementing performance measures that would assess the accuracy and sufficiency of the model's Flight Standards inspector projections. As a result, FAA will be limited in its ability to determine whether the model provides reliable information on projected inspector staffing levels. In addition, in 2017 FAA realigned Flight Standards from a geographic-based to a four-area, function-based organization[9] and is developing two new models to help determine inspector staffing requirements for air carrier and general aviation operations. However, these models are in various stages of development, and FAA has not determined how the Agency will incorporate them into the staffing model framework. Given that FAA has not finalized these decisions, it will be limited in its ability to fully improve its inspector staffing projections to meet the changing aviation environment and its new organizational structure.

FAA does not make full use of the model's functions and relevant data to project current and future inspector staffing levels.

Our review of FAA's assumptions and methodologies for determining staffing needs showed that the Agency currently uses the model to project 10 years of nonsupervisory inspector staffing estimates for Flight Standards and Aircraft Certification for its annual safety workforce plan and budget submissions. However, FAA only projects a single national inspector staffing number for each year, even though the system has the capability to project staffing at the office level. According to the Agency, as a result of the realignment from a regional to a functional office structure, this single estimate gives Flight Standards the flexibility to share inspector resources among field offices to meet its changing oversight needs and make the most efficient use of existing resources. However, it does not always mean that managers at individual offices believe they are sufficiently staffed. Fifty-nine percent of the 22 Certificate Management Office (CMO) managers and 79 percent of the 68 Flight Standards District Office (FSDO) managers who responded to our survey said that their offices are short-staffed. Also, while the Flight Standards' national staffing estimates are reviewed twice a year by subject matter experts, some field managers told us in surveys and interviews that they had not reviewed the model's staffing estimate for their offices since the 2018 timeframe, and in some cases were unaware that their offices had a staffing estimate. Moreover, Aircraft Certification has not extensively used the model since 2017 because it uses its own internal systems along with the model to determine its inspector staffing needs. Finally, the model relies on

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[9] The four functional areas are the Offices of Air Carrier Safety Assurance, General Aviation Safety Assurance, Safety Standards, and Foundational Business.

historical data that do not fully capture the scope of the inspectors' workload and does not use demand-driven data, which would give FAA more up-to-date information on inspector activities, such as their responsibilities for overseeing unmanned aircraft systems (UAS), an increasing workload driver for the Agency. FAA also will need time for a recently introduced system, known as the Office Workload List, to collect inspector work activity data that can be analyzed and used to guide Flight Standards staffing decisions. As a result, it is uncertain when FAA will fully improve its inspector staffing projections to meet the changing aviation environment and its new organizational structure.

The inspector staffing model does not account for work performed by designees.

The model only accounts for the time inspectors spend overseeing individual and organizational designees. It does not collect data on the type and amount of work these outside parties perform on FAA's behalf or project the work they may perform in the future. FAA has developed the Designee Management System (DMS), a web-based tool for tracking work performed by designees. However, the Agency has not fully implemented the DMS due to ongoing work to integrate Flight Standards designees into the system and has yet to make key decisions regarding its use, such as whether the system will track work performed by both individual and organizational designees. Until FAA addresses these issues, it will be unable to make informed decisions about the additional types and amount of work it can delegate or whether it can make corresponding changes to the inspector workforce.

We are making recommendations to improve the accuracy of FAA's inspector staffing projections and enhance the capabilities of the staffing model.

FAA Has Addressed Several Weaknesses in the Model but Has Not Implemented Key Changes That Would Improve Inspector Staffing Projections

FAA has taken steps to improve the inspector staffing model by fully implementing 16 of the 25 NRC recommendations. These actions include improving the model's data by using information from existing systems and enhancing the model's software so it can be easily modified. However, the Agency has not taken substantive action on three recommendations, including developing performance measures to assess the accuracy of the model's staffing estimates. Further, FAA has yet to implement two new models that would reflect organizational changes.

FAA Has Made Progress in Implementing the NRC Recommendations but Weaknesses in the Model Remain

In 2013, FAA commissioned a study that showed it had fully implemented only 9 of the 25 NRC recommendations, partially implemented 9 recommendations, and had not taken any action on 7 recommendations. Since then, FAA has taken steps to further improve the model and, based on our assessment, the Agency has fully implemented 16 recommendations. The Agency has also partially implemented an additional six recommendations, such as validating the model and ensuring the model includes relevant inspector workload data, but has not taken action on three recommendations (see table 2).

Table 2. FAA's Inspector Staffing Model: Implementation Status of the 2006 NRC Recommendations*

Status	Status Description	2013 FAA Gap Analysis Report	2020 OIG Assessment of FAA's Implementation
	The NRC report recommendation was implemented/completed.	9	16
	Efforts have been made to implement the NRC report recommendation but further actions are required.	9	6
	There are gaps present or no evidence to support that action was taken to address the NRC recommendation.	7	3

*See exhibit A for details on the implementation status of the 25 NRC recommendations.

Source: OIG analysis

FAA improved the model in two general areas:

- **Data:** FAA has taken constructive steps to improve the model's data, including using relevant information from its existing data systems, having subject matter experts review and validate field-level data, updating labor distribution project and task codes, and revising the model's data input approval process. We interviewed outside contractors and a representative from the Professional Aviation Safety Specialists union, who indicated that the quality of the data, while not perfect, was much improved.

- **Model Structure:** The 2013 FAA-commissioned study cited several areas of deficiency, including that the previous model was not easy to modify or enhance and did not provide a clear understanding of how it calculated staffing requirements and related inputs, such as future inspector activities. During this audit, we found that FAA has enhanced the model's software so it can be easily modified to include new data inputs and facilities. The Agency also simplified the model's formula to allow users to calculate future inspector activities more easily.

FAA Has Not Developed Performance Measures To Determine the Accuracy of the Model's Staffing Projections

One of the three NRC recommendations in which FAA has not taken substantive action specifically addresses the need to develop performance measures for the Flight Standards inspector workforce. In addition, four of the six recommendations we assessed as partially implemented are dependent on the completion of performance measures. According to the NRC study, these measures would allow the Agency to assess the accuracy of the staffing model's projections, measure inspector performance, and provide critical information to decision makers about the purpose of the staffing and the consequences of its staffing decisions. In addition, at the request of FAA's Office of Labor Analysis, in April 2017 Ernst & Young completed an assessment of the staffing model and made additional recommendations, including implementing performance metrics and systems to compare the model's results with actual staffing levels.

FAA started developing the performance measures in 2013 but has not implemented them or examined whether past model estimates were accurate and met the Agency's oversight needs, as NRC recommended. FAA is considering 10 demand-driven metrics for Flight Standards, such as inspector backlog of work and number of inspections conducted. While these metrics will help gauge inspector workload, they have yet to be finalized and, according to FAA officials, may not measure the model's accuracy or the consequences of staffing decisions. In addition, if approved, these metrics will require the Agency to collect and analyze relevant data, which could take years to complete. It is also unclear whether the metrics can effectively measure inspector performance or how they will assist with inspector staffing decisions.

The Model Does Not Support Inspector Allocation and Sufficiency Decisions and Did Not Undergo an Initial Cost-Benefit Analysis

According to NRC, the inspector staffing model should support Flight Standards inspector workforce allocation and sufficiency decisions. Allocation relates to the effective distribution of resources to field offices, even when there are fewer available resources than the number required. Sufficiency pertains to the staffing needed to maintain an acceptable level of safety and organizational performance,

which requires setting standards and corresponding measures to determine whether these levels have been met.

We found that Flight Standards does not use the current model to help allocate inspectors to field offices, even when there are staff shortages. Rather, it only uses the model to project a single national inspector staffing figure.[10] In addition, because FAA has not developed performance measures or finalized metrics for this area, it cannot determine whether the model's staffing estimates are sufficient for the Agency's needs.

FAA also did not implement the NRC recommendation to conduct a cost-benefit analysis during the design phase of any proposed model. According to FAA officials, they did not do so because they need the model to estimate the inspector staffing projections that are included in the Agency's statutory-mandated safety workforce plan.[11]

FAA Has Not Fully Implemented Model Adjustments That Reflect Organizational Changes

In 2017, FAA realigned Flight Standards from a geographic-based to a four-area, function-based organization to better align its resources to meet the current and future needs of the aviation industry. According to the Agency, breaking down geographic barriers gives FAA greater flexibility to share inspector resources across offices. Two of these areas, the Offices of Air Carrier Safety Assurance and General Aviation Safety Assurance, perform the vast majority of Flight Standards' oversight activities and house most of its safety inspectors.[12]

As a result of this realignment, FAA is developing two new models to help determine inspector staffing requirements for these new offices.[13] Both models calculate national inspector staffing levels for each area but also allow staffing decisions to be based on such factors as local staffing imbalances and locations with excess or specialized work. However, these models are in various stages of development, and Flight Standards has not finalized the requisite software to

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[10] For a detailed explanation of how FAA uses the model to estimate its current and future inspector staffing needs, see the next section of this report.

[11] This plan is mandated in the Agency's annual appropriations act. For fiscal year 2021, see the Consolidated Appropriations Act, 2021, Pub. L. 116-260 (2020). In addition, the FAA Modernization and Reform Act of 2012 required the Agency to implement the inspector staffing model it developed in response to the NRC study by October 1, 2012. See Pub. L. No. 112-95 (2012) (codified at Title 49 U.S Code, § 44701 note).

[12] The other Flight Standards functional areas are the Offices of Safety Standards and Foundational Business.

[13] FAA is also developing an inspector model for the Office of Safety Standards, but it is in the early stages of development and is not expected to be implemented for several years.

operate the models or determined whether it will incorporate the models into the current staffing model framework.

In addition, earlier this year FAA approved updated business rules for the new air carrier and general aviation models. These business rules use a position classification guide—commonly known as the complexity guide[14]—as a core component in developing the new rules. However, in 1995, FAA determined that the guide's methodology was ineffective for making staffing decisions. Moreover, during our 2013 audit, FAA Headquarters officials told us the guide should no longer be used to determine staffing needs, although we found that most of FAA's field offices were still using it for that purpose. As part of this current audit, we surveyed 92 CMO and FSDO managers[15] about their views on the inspector staffing model, office staffing situations, and related questions. Sixty-five percent of the 17 CMO managers and 87 percent of the 53 FSDO managers who responded to our survey stated they continued to use the guide when making decisions on inspector staffing. In addition, 59 percent of 17 CMO managers and 61 percent of 51 FSDO managers said that the guide did not help them categorize inspector tasks.

On July 29, 2020, FAA's Office of Human Resources cancelled use of the complexity guide for determining inspector compensation. However, FAA officials informed us that the Agency can still use the guide to assist with workforce planning, including with the staffing models. FAA used the complexity guide as the basis for the business rules, but according to FAA officials, they modified the rules to better reflect the operating environment in which inspectors operate. For example, according to FAA officials, the rules now account for on-demand work and allow the Agency to (1) project staffing needs based on sharing inspector resources across office and geographic boundaries, and (2) use a risk-based decision-making process in staffing offices. While Flight Standards has approved these rules, it has not yet fully tested and implemented them at field offices, and they are subject to review every 6 months. As a result, it is uncertain whether these new business rules will resolve the issues associated with the use of the complexity guide and capture the full scope of the inspectors' workload.

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[14] Complexity guide: A position classification guide that determines grade levels for FAA safety inspectors and justifies inspector grades based on specific characteristics (the "complexity") of the position. See *Position Classification Guide—Aviation Safety Inspector Positions (Air Carrier and General Aviation)*, FG-1825, April 1998.
[15] This included 22 CMO managers and 70 FSDO managers. The response rate for the survey was 92 percent, although most questions were not answered by all respondents.

FAA Does Not Use All of the Model's Functions or Fully Capture Relevant Data To Project Inspector Staffing Levels

FAA currently uses the inspector staffing model to produce annual forecasts for 10 years of nonsupervisory inspector staffing estimates for Flight Standards and Aircraft Certification workforce plans and budget submissions. However, FAA only uses the model to project a single national inspector staffing figure, even though the system can project staffing levels at the office level, and some Flight Standards managers have not reviewed staffing estimates for their field offices since 2018. Similarly, Aircraft Certification has not used the model extensively since 2017 and also relies on its own systems to determine inspector staffing needs. Further, the model relies primarily on historical data rather than up-to-date, demand-driven data to project staffing levels.

FAA Does Not Fully Use the Model and Its Results To Determine the Agency's Inspector Needs

The current model's primary structure was last modified in 2017 to align with organizational changes. It uses inputs that include historical staffing and workload data from the Agency's labor distribution and other financial and safety tracking systems,[16] as well as annually forecasted aviation industry activities from FAA's Office of Policy and Plans. Using these inputs, the model projects staffing levels[17] that factor in the time inspectors spend working on their duties, as well as items such as leave and training. A multidisciplinary team of model developers, field personnel, union representatives, and other subject matter experts reviews the data and the resulting projections semiannually for accuracy, trends, and outliers. The results are subject to a separate management review in which other factors—such as the addition of non-modeled management and policy positions and budgetary considerations—can change the final inspector staffing figures. FAA runs the model's projections twice a year and uses them in the Agency's annual budget submissions and safety workforce plans.

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[16] These systems include the Federal Personnel Payroll System, Safety Assurance System (SAS), and Program Tracking and Reporting Subsystem (PTRS).
[17] In terms of full-time equivalents or FTEs.

FAA Only Uses the Model To Project a Single National Inspector Staffing Estimate That Does Not Meet Its Needs

The NRC study recommended that the staffing model should be scalable to support different levels of analysis, such as predicting inspector staffing needs at the national and regional levels and providing guidance on staffing at the office level. The study also recommended that FAA validate the results to ensure the model's predictions of inspector supply, demand, and imbalances provide an accurate assessment of the Agency's inspector staffing needs.

We found that the current model has the capability to provide these types of analyses, but FAA only uses it to project a single national inspector staffing estimate—mainly for Flight Standards. According to the Agency, as a result of the realignment from a regional to a functional office structure, this single estimate gives Flight Standards the flexibility to share inspector resources among field offices. In addition, due to the changing oversight needs of operators and operations, using a single national number allows Flight Standards to reallocate inspectors based on the criticality of work activities and make the most efficient use of existing resources.

However, managers in the field offices, where most of the Flight Standards' safety inspectors are located, indicated that their offices are short-staffed. These inspectors mostly work in two types of field offices: (1) CMOs, which specialize in the certification, surveillance, and inspection of major air carriers and Flight Safety International's Part 142 training centers,[18] and (2) FSDOs, which oversee general aviation operations and perform a variety of functions, including licensing pilots, mechanics, and other aviation professionals; ensuring compliance with and enforcement of airmen and aircraft regulations; overseeing repair stations; and investigating aircraft accidents.

As shown in figure 1, 59 percent of the CMO managers and 79 percent of the FSDO managers who responded to our survey stated that they did not have enough nonsupervisory safety inspectors to meet the office's current workload.

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[18] FlightSafety International is a private company that provides pilot, technician, and aviation-related training to private companies, governments, and military operators around the world. FAA dedicates a CMO to oversee this operation. A Part 142 training center is an organization that provides training, testing, and checking under contract or other arrangement to airmen subject to Title 14, Code of Federal Regulations, Part 142.

Figure 1. Does Your Office Have Enough Nonsupervisory Safety Inspectors To Meet Your Total Workload?
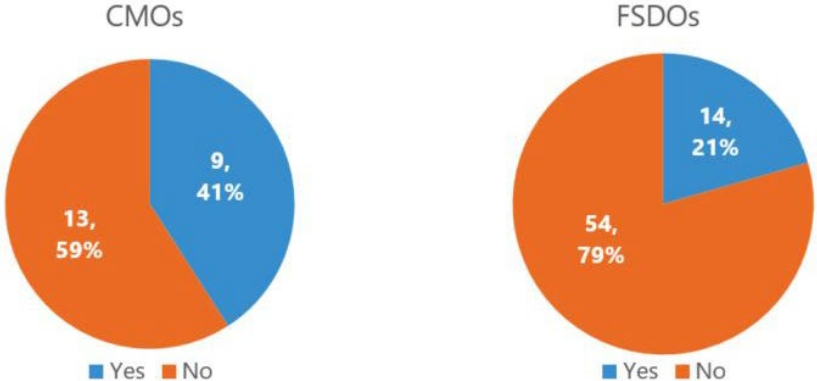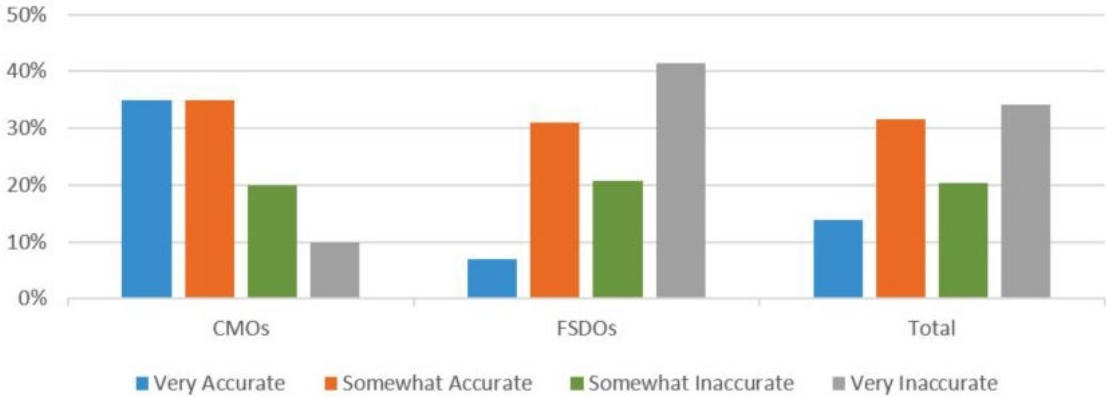

Number of respondents: CMO managers = 22. FSDO managers = 68.

Source: OIG

In addition, while 70 percent of CMO managers stated that the model's staffing estimates were very or somewhat accurate, over 62 percent of FSDO managers stated that the estimates were somewhat or very inaccurate (see figure 2).

Figure 2. How Accurate Is the ASTARS Nonsupervisory Inspector Staffing Estimate in Meeting Your Office's Current Workload?

Number of respondents: CMO managers = 20. FSDO managers = 58.

Reasons cited by managers for the understaffing included an increasing workload; difficulties filling hard-to-staff positions; a Flight Standards staffing cap that prohibits new hires without corresponding retirements, transfers, or other attrition; and an extended hiring and training process for new inspectors. In addition, FSDO managers stated that the model does not adequately account for

on-demand work—such as airman certifications, accident investigations, and other unscheduled or walk-up work—as well as their increasing oversight of UAS.

Some Flight Standards Office Managers and Aircraft Certification Officials Did Not Review Previous Model Estimates

The model includes a process by which field managers can review and provide feedback on staffing estimates for their offices.[19] While the Flight Standards' staffing estimates are reviewed twice a year by subject matter experts at the national level, some CMO and FSDO managers we surveyed and interviewed indicated that they had not reviewed the estimates for their offices since approximately 2018. In some cases, managers were unaware that there was a staffing estimate for their office. According to a Flight Standards official, this is because staffing resources are allocated at the functional office level, and the staffing estimates are reviewed by subject-matter experts. This lack of review at the office level is underscored in figure 3, which shows that nearly half of the CMO and FSDO managers who responded to our survey were not sure whether the current model's staffing estimates better reflected their nonsupervisory inspector staffing needs than previous estimates did.

Figure 3. Compared To Previous Years, Do The Current ASTARS Results Better Reflect Your Nonsupervisory Inspector Staffing Needs?
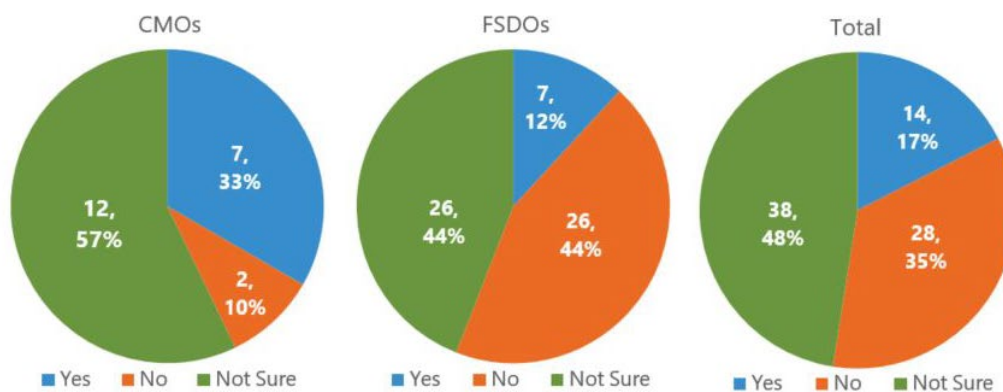
Number of respondents: CMO managers = 21. FSDO managers = 59.

Source: OIG

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[19] This process is known as the Online Manual Data Records, or OMDR.

In addition, we determined that the review process for the 2019 Aircraft Certification inspector staffing estimate was poorly managed; senior Aircraft Certification management did not see the staffing estimates until the final review. One reason for this was that a number of new employees were unaware of their responsibilities for reviewing the model's results. While FAA had documented the review process, an Agency official conceded that the documentation was neither detailed enough to allow new employees to understand their responsibilities nor communicated to them early in the process. This official also said that the Agency had resolved this issue, and the 2020 review process had been much smoother.

Aircraft Certification Uses Its Own Internal Systems To Help Determine Inspector Staffing Needs

While FAA used the staffing model to estimate Aircraft Certification's inspector staffing for the 2020 safety workforce plan, officials in that office stated that they stopped using the model in 2017. Instead, Aircraft Certification used an internal workload matrix tool to estimate its inspector staffing and resource sharing needs. Originally designed to complement the staffing model, this tool considers inspector workload based on several factors, such as designee management risk, complexity, and work volume. Aircraft Certification plans to continue using the matrix tool, along with additional tracking systems and tools,[20] and refine it to help management make staffing decisions and "understand workload variations across the organization and how to better balance resources." Currently, Aircraft Certification uses both the model and its internal systems to project its inspector staffing.

Aircraft Certification officials also noted that they plan to increase their use of the inspector staffing model in the future and were working on a statement of work with Volpe regarding the specific data they require. However, they did not provide a timeframe to indicate when they would sign the statement of work or begin to use the inspector staffing model again.

The Model Relies on Data That Do Not Fully Capture the Scope of the Inspectors' Workload

The inspector staffing model makes projections by relying primarily on historical inspector staffing figures and workload data taken from FAA's existing data systems, including the labor distribution system, Safety Assurance System (SAS),

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[20] These systems include Aircraft Certification's Work Tracking System, Airworthiness Certification's online tool, Compliance and Enforcement Action's online tool, and the Agency's labor distribution system.

and Program Tracking and Reporting Subsystem (PTRS).[21] It also relies on forecasted changes in certain aviation indicators—such as aircraft fleet, airman, and company changes—to project future staffing levels.[22]

However, the model does not include demand-driven performance metrics, such as the estimated number of future inspections, which would give FAA more up-to-date information on inspector activities. FAA is developing 10 demand-driven metrics for Flight Standards, but they have not been finalized for use. It is also unclear how FAA will use these metrics in conjunction with the staffing model or to project future inspector staffing levels.

One of the demand drivers FAA is considering is the number of UAS tasks handled by inspectors. This is an increasing workload driver for FAA, with recent forecasts indicating that the number of UAS in the United States is likely to exceed 2 million by 2022. However, FAA cannot adequately determine its inspector staffing needs for this additional oversight responsibility. This is due to various internal uncertainties regarding the Agency's oversight of the industry related to finalizing regulations, determining certification and surveillance differences between UAS and other types of aircraft or operators, and implementing corresponding oversight procedures. Even when these issues are addressed, it will take time for FAA to collect the necessary data to accurately project its staffing needs.

In addition, FAA is taking steps to gather on-demand and other data that impact inspector workload. Most notable, last year it introduced the Office Workload List, a system that FAA will merge into the SAS and use to record nearly all inspector work activities,[23] including on-demand and designee management activities. Information collected in the Office Workload List will be combined with other planning and reporting information to produce an online report that can aggregate different types of work activities at the local office or national levels. However, as the system was introduced in 2020, it will take some time to populate it with enough data to ensure the resulting reports can assist FAA with inspector staffing decisions.

As a result of these data issues, FAA's staffing projections may not be adequate to meet the Agency's current and future oversight responsibilities.

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[21] SAS is the oversight tool FAA uses to perform certification, surveillance, and continued operational safety activities of the civil aviation sector. It includes software that Flight Standards uses to capture data when conducting oversight activities. PTRS is an information management and analysis system used to collect, store, and analyze data resulting from the different job functions performed by safety inspectors.

[22] These forecasts are produced by FAA's Office of Aviation Policy and Plans.

[23] Work activities not captured by the Office Workload List include initial certification, configuration change, and surveillance activities, which are already captured in SAS.

The Inspector Staffing Model Does Not Account for Work Performed by Designees

As a result of mandates in its 2018 reauthorization,[24] FAA is reviewing whether it can expand the role individual and organizational designees play in overseeing the aviation industry. This includes allowing them to conduct additional activities typically performed by the Agency's inspectors, such as pilot and aircraft certification activities, and creating new organizational designees for areas such as airman certification and approving aircraft inspection programs.

However, the inspector staffing model only accounts for the time inspectors spend overseeing individual and organizational designees. It does not collect data on the type and amount of work these outside parties perform on behalf of FAA or project the work they may perform in the future. Without this information, the Agency cannot make informed decisions regarding the types and amount of work that can be further delegated to outside parties.

In 2014, FAA developed the DMS, a web-based tool designed to standardize the management and oversight of individual designees. One feature will allow FAA to track the work that designees perform on its behalf, providing the Agency with additional information that can be used to help determine its inspector staffing needs.

However, FAA has not fully implemented the DMS or made key decisions regarding its use in a number of areas. Specifically,

- Currently the DMS only tracks work performed by individual designees, not the work performed by ODAs, although it has this capability. FAA is still determining whether it will include ODAs in the system or use existing systems to track their work.

- FAA has not fully integrated approximately 2,200 of 3,800 Flight Standards individual designees (about 58 percent) into the DMS,[25] due in part to delays related to the COVID-19 pandemic. FAA expects to fully integrate these designees into the system by the end of calendar year 2021; until then, the Agency will be unable to track all of their activities.

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[24] Pub. L. No. 115-254, §§ 202, 212–213 (2018).

[25] These designees' duties include reviewing aircrew programs, training centers, and designated aircraft dispatcher examiners.

- FAA has not decided how it will use the system's data to manage designee duties or whether it will incorporate the DMS data into the inspector staffing model.

As a result, FAA is limited in its ability to make informed decisions regarding the types and amount of work that can be further delegated to individual designees and ODAs or whether it can make corresponding changes to the inspector workforce.

Conclusion

FAA oversees the largest and most diverse aviation system in the world and must have a sufficient inspector workforce in place to oversee this system. The Agency has taken steps to improve its inspector staffing model and is introducing new systems that will help it better estimate its inspector staffing needs. However, the Agency has not yet implemented all these systems or addressed long-standing recommendations that could further improve its model. Until FAA is able to take full advantage of these systems' capabilities, it will continue to face challenges in determining its inspector staffing needs.

Recommendations

To improve the accuracy of FAA's inspector staffing projections and enhance the capabilities of the staffing model, we recommend that the Federal Aviation Administrator:

1. Institute a process that compares the inspector staffing model estimates to actual staffing levels. The process should identify the reasons for the differences between the two figures, establish performance measures that help assess the accuracy of the model's results, and actions taken to improve future forecasting.

2. Finalize the demand-driven metrics and determine how they will be used in conjunction with the inspector staffing model.

3. Develop and implement a plan with milestones for completing the air carrier and general aviation staffing models, including information on how the Agency plans on using them in conjunction with the current staffing model, the process by which the business rules are updated, and the results of the most recent review of the business rules.

4. Produce inspector staffing estimates and actual staffing levels at the functional and field office levels. Include these figures in the Agency's annual safety workforce plan.

5. Reinstitute the process in which Flight Standards office managers review their staffing estimates.

6. Track progress on implementing the Office Workload List, including milestones to show when the Agency anticipates using information from the system to assist with inspector staffing decisions.

7. Update information regarding implementation of the Designee Management System, including milestones to show when FAA anticipates fully integrating individual designees into the system and how it intends to use the system's data to determine whether to adjust its inspector workforce staffing levels and responsibilities.

Agency Comments and OIG Response

We provided FAA with our draft report on June 16, 2021, and received its formal response on July 13, 2021, which is included as an appendix to this report. FAA concurred with recommendations 2, 3, 5, 6, and 7 and provided appropriate planned actions and completion dates. FAA partially concurred with recommendations 1 and 4 and provided planned completion dates.

For recommendation 1, FAA did not agree to compare the staffing model's estimates to actual staffing results. Rather, it proposed comparing the staffing model's estimates to "actual staffing level results," stating that this is in line with how the Agency reports its year-end inspector staffing figures in the workforce and budget documents DOT provides to Congress. Based on this response and further clarification we received from FAA, we revised the recommendation to reflect this request.

For recommendation 4, FAA did not agree to produce staffing estimates for "functional and field office levels," stating that its Aviation Safety organization is organized at the "Service and Office level." As an alternative, it plans to produce staffing estimates at the service and office level consistent with reporting documents the Agency and Department provide to Congress.

However, FAA's proposed strategy for recommendation 4 will not meet the intent of our recommendation because it will not provide sufficient information regarding its inspector staffing workforce at the facility level. In its 2006 report, the NRC noted that, in addition to an inadequate number of inspectors, Congress

and other stakeholders had additional concerns regarding how FAA allocates its inspector staffing workforce to accomplish its workload, including:

- FAA inconsistently dispersing inspectors across regions, districts, and facilities as compared to workload distribution, especially given the industry's growth and complexity.

- Some offices may experience work overload while others do not, resulting in wide variations in workload across the inspector workforce.

- FAA may not have geographically redistributed its inspector resources in response to industry changes.

FAA's planned reporting strategy will only provide high-level, summary staffing information rather than detailed staffing information for the four functional areas and individual field offices. Our survey revealed that inspector staffing shortages continue at individual locations, even after the Flight Standards reorganization. As a result, Congress and other stakeholders will not obtain additional insights on inspector staffing decisions. Unless FAA accounts for data at the functional and office level as well as performance measures, it will not be able to adequately assess and report on its staffing needs. Therefore, we consider this recommendation open and unresolved and request that the Agency reconsider its position.

Actions Required

We consider recommendations 1, 2, 3, 5, 6, and 7 resolved but open pending completion of the planned actions. For recommendation 4, we consider our recommendation open and unresolved. We request that the Agency reconsider its position and provide us with a revised response within 30 days of the date of this report in accordance with DOT Order 8000.1C.

Exhibit A. Scope and Methodology

We conducted this performance audit between March 2020 and June 2021 in accordance with generally accepted Government auditing standards as prescribed by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Section 303 of the FAA Reauthorization Act of 2018 directed FAA to update its safety-critical staffing model to determine the number of aviation safety inspectors it needs to fulfill its safety oversight mission. The act also directed our office to conduct an audit of the staffing model, including the assumptions and methodologies used in the model and whether the model accounts for FAA's authority to fully use designees. Accordingly, our audit objectives were to (1) assess the changes FAA made to update the inspector staffing model, (2) review the assumptions and methodologies the model uses to predict the number of aviation safety inspectors FAA needs to meet its current and future oversight responsibilities, and (3) determine how FAA's model accounts for the use of designees.

To assess the changes FAA made to update the aviation inspector staffing model, we interviewed representatives from FAA's Flight Standards Service, Labor Analysis, and Aircraft Certification Service offices, as well as Volpe representatives, outside contractors, and a Professional Aviation Safety Specialists (PASS) representative. We relied on these interviews to determine the changes FAA had made to the current staffing model since our 2013 report, as well as any planned changes to the model and the reasons for those changes. We obtained supporting documentation, including FAA-commissioned reports and other documents that explained these changes. We also determined the status of 25 recommendations identified by NRC in its 2006 study and subsequently evaluated by Grant Thornton LLP in a 2013 FAA-commissioned gap-analysis study. Through interviews with officials from Flight Standards, Labor Analysis, and Volpe, as well as our reviews of supporting documentation, we examined whether FAA had implemented the NRC recommendations. (See exhibit D for our analysis on the status of the recommendations.)

To review the assumptions and methodologies the model uses to predict the number of aviation safety inspectors FAA needs to meet its current and future oversight responsibilities, we obtained a variety of data. These included the current model FAA uses to make inspector staffing projections for the offices in Flight Standards and Aircraft Certification, the model's formulas for projecting

current and future staffing levels, and the data used in the model. We interviewed representatives from Flight Standards, Labor Analysis, and Aircraft Certification Service, as well as from Volpe, Ernst & Young, and PASS about the model's structure, formula, and how FAA uses it to determine current and future inspector staffing needs. We reviewed relevant reports and studies regarding the model's structure, methodology, assumptions, and data. We also attended two of FAA's semiannual subject matter expert meetings to gain insights on how the Agency reviews and refines the model's projections; potential changes to the model, such as the commercial and general aviation staffing models; and additional issues, such as implementing demand-driven performance measures.

To determine how FAA's model accounts for the use of designees, we obtained updates from FAA representatives on their efforts to better track work performed by individual and organizational designees in response to congressional mandates, as well as how the Agency plans to incorporate DMS data into the inspector model. We also determined the status of the DMS, including the number of individual designees currently tracked by the system, whether the system will track activities performed by organizational designees, and FAA's process for using the system.

To help answer objectives 1 and 2, we worked with OIG statisticians to conduct an online survey of CMO and FSDO managers on various aspects of the current inspector staffing model. Our questions centered on whether the model's inspector staffing projections met the managers' current and future needs, their offices' current inspector staffing levels, the impact of organizational changes on their offices' oversight responsibilities, and the use of the inspector position classification guide we identified in our 2013 report, among other topics. We sent the survey to a census of 100 CMO and FSDO managers, and it was open for responses from October 20, 2020, to November 6, 2020. We received responses from 92 managers (22 CMO and 70 FSDO managers) for a survey response rate of 92 percent, although most respondents did not answer all the survey questions. We judgmentally selected nine managers (three CMO and six FSDO managers) for followup interviews to gain further insights regarding their responses.

We performed a limited test to assess the accuracy of the data FAA used in the model to determine its inspector staffing projections. With assistance from OIG's statisticians and using model data provided by Volpe, we examined the source data used by the staffing model from fiscal year 2013 to fiscal year 2020. Specifically, we compared the source data FAA used to determine CMO and FSDO nonsupervisory inspectors to similar data from the Federal Personnel Payroll System. This analysis, along with interviews of FAA and Volpe representatives, outside contractors, and the PASS representative, indicated that the data were reliable for the purposes of our audit.

Exhibit B. Organizations Visited or Contacted

Federal Aviation Administration

Associate Administrator for Aviation Safety

- Flight Standards Service

- Aircraft Certification Service

Assistant Administrator for Financial Services

- Office of Labor Analysis

Certificate Management Offices (CMO)

- Cascadia CMO

- Great Atlantic CMO

- Orlando CMO

Flight Standards District Offices (FSDO)

- Boston FSDO

- Greater Chicago FSDO

- Los Angeles FSDO

- Louisville FSDO

- Spokane FSDO

- Springfield FSDO

Other Organizations

Ernst & Young

Professional Aviation Safety Specialists (PASS)

John A. Volpe National Transportation Systems Center

Exhibit C. List of Acronyms

ASTARS	Aviation Safety Staffing Tool and Reporting System
AVS	Associate Administrator for Aviation Safety
CMO	Certificate Management Office
DMS	Designee Management System
DOT	Department of Transportation
FAA	Federal Aviation Administration
FSDO	Flight Standards District Office
NRC	National Research Council
ODA	Organization Designation Authorization
OIG	Office of Inspector General
OMDR	Online Manual Data Report
PASS	Professional Aviation Safety Specialists
PTRS	Program Tracking and Reporting Subsystem
SAS	Safety Assurance System
UAS	Unmanned Aircraft Systems

Exhibit C. List of Acronyms 24

Exhibit D. Completion Status: 2006 NRC Inspector Staffing Model Recommendations

Note: The first 23 recommendations relate to Flight Standards inspector model and the last 2 relate to the Aircraft Certification inspector model. Recommendations in bold include provisions relating to developing performance measures for the Flight Standards inspector workforce.

Key: 🟢 = completed   🟡 = incomplete   🔴 = not complete

NRC Report Recommendation	NRC Recommendation Description	2013 FAA Gap Analysis Report	2020 OIG Assessment of FAA's Implementation	Explanation for OIG's Assessment
Invest in New Aviation Safety Inspector Staffing Model	Flight Standards should invest in a new inspector staffing model.	🟢	🟢	
Avoid Overreliance on Previous Models	Development efforts should not be limited to dependence on previous modeling efforts; however, some knowledge and experiences can be used to develop a new model.	🟢	🟢	
Conduct Analysis of Inspector Staffing Need Structure	Conduct analysis on Flight Standards organizational structure, geographical distribution of inspector resources, and the role of the inspectors and their work activities.	🔴	🟢	
Involve Affected Stakeholders in Model Design, Development, and Implementation	Inspectors and field managers should have significant roles and be actively engaged in all phases of model design, development and implementation.	🟢	🟢	
Cost-Benefit Analysis Should Be Conducted	Model team must conduct a cost-benefit analysis of proposed efforts concerning model development.	🔴	🔴	According to FAA officials, they did not complete a cost-benefit analysis because the model is needed to estimate the inspector staffing projections that are included in the Agency's statutory-mandated safety workforce plan.

NRC Report Recommendation	NRC Recommendation Description	2013 FAA Gap Analysis Report	2020 OIG Assessment of FAA's Implementation	Explanation for OIG's Assessment
Define Model Requirements	Model requirements should be defined, including decisions about which questions about inspector staffing the model should address, what data sources will be needed, and what specific measures of effectiveness will be used.	🟡 (yellow)	🟡 (yellow)	The model's requirements were defined during its developmental phase and have been updated over time. This includes the model's purpose, scope, and process for calculating and forecasting inspector staffing levels. However, FAA has not implemented performance measures to determine the effectiveness of the model.
Model Should Be Transparent	The model should be relatively easy for stakeholders to understand and explain, especially model users and those directly affected by decisions made using the model.	🔴 (red)	🟢 (green)	
Model Should Be Scalable	The model should support analyses at different levels of aggregation with the national level being the most important.	🟡 (yellow)	🟢 (green)	
Model Should Be Usable	The model, as a software application, should be relatively easy to implement and enhance and it should have a user-friendly interface.	🟡 (yellow)	🟢 (green)	
Model Should Be Relevant	The model design should incorporate important issues/inspector workload data and exclude less important or marginally relevant issues/data to the inspector workload, and operate at the right level of detail.	🟢 (green)	🟡 (yellow)	FAA continues to incorporate relevant data that is evaluated twice-a-year by subject matter experts into the current model. However, our survey results and interviews with field managers indicate that on-demand work data, including UAS-related activities, is not fully captured and included in the model's staffing estimates.
Model Should Be Valid	The model should predict actual (real-world) outcomes.	🔴 (red)	🟡 (yellow)	The 2013 Gap Analysis noted that the current model had relied heavily on field survey data that had not been validated. Since then, FAA has improved the model's data quality by using relevant information from its existing data systems and updating labor distribution project and task codes. The data has improved to the point where outside contractors and an inspectors' union representative indicated that the quality of the data, while not perfect, was much improved. However, FAA has not implemented performance measures to determine whether the model's staffing estimates were accurate.

Exhibit D. Completion Status: 2006 NRC Inspector Staffing Model Recommendations

NRC Report Recommendation	NRC Recommendation Description	2013 FAA Gap Analysis Report	2020 OIG Assessment of FAA's Implementation	Explanation for OIG's Assessment
Develop Meaningful Performance Measures	Develop and establish measures of outcomes or performance that can be applied to overall inspector workforce performance, as well as organizational measures that can be used to assess the "correctness" of staffing levels predicted by the model.	🔴 Red	🔴 Red	FAA started developing the performance measures in 2013 but has not implemented them nor have they examined whether past model estimates were accurate and met the Agency's oversight needs. FAA is considering 10 demand-driven metrics for Flight Standards, such as inspector backlog of work, but they have yet to be finalized and may not measure the model's accuracy or the consequences of staffing decisions.
Model Should Be Populated With Data From Existing Databases	To ensure the use of current information without incurring the costs of data collection, validation and warehousing, the staffing model should be supported by institutionalized administrative databases, not by ad hoc surveys.	🟡 Yellow	🟢 Green	
Define Model Specifications	Model specifications should be defined including high-level software architecture, basic data flows, computational algorithms, and data structures.	🟡 Yellow	🟢 Green	
Model Should Support Both Sufficiency and Allocation Decisions	Model should support decision making in both sufficiency and allocation decisions.	🔴 Red	🔴 Red	Flight Standards does not use the current model to assist with allocating inspectors to field offices, even when there are staff shortages. Rather, it only uses the model to project a single national inspector staffing figure. In addition, because FAA has not developed performance measures or finalized metrics for this area, it cannot determine whether the model's staffing estimates are sufficient for the Agency's needs.
Model Should Be Empirically Based	Model should be based on empirical data, although certain relationships may be established initially using expert judgment.	🟡 Yellow	🟢 Green	
Model Should Consider a Hybrid of Both Process Simulation and Statistical Relationships	Staffing model designers should consider the use of both process simulation and statistical relationships for each aspect of the model.	🟡 Yellow	🟢 Green	

NRC Report Recommendation	NRC Recommendation Description	2013 FAA Gap Analysis Report	2020 OIG Assessment of FAA's Implementation	Explanation for OIG's Assessment
Incorporate Workforce Supply and Demand Into the Model	The model should incorporate representations of workforce supply and demand.	🟡	🟡	The 2013 Gap Analysis report stated that FAA had incorporated workforce demand into the model but that gaps still existed, mainly in terms of quality. FAA is making progress in examining workload demand, notably with the development of 10 demand-driven metrics for Flight Standards. However, these metrics have yet to be finalized and implemented. In addition, while subject-matter experts review the model's staffing projections twice-a-year, the 2013 Gap Analysis noted that model's supply data was validated via the OMDR process to help determine the viability of the model's estimate against a field office's actual staffing level. However, FAA discontinued this process around the 2018 timeframe.
Develop Model Software	Model software development should make use of modern software engineering techniques and tools and use an iterative development approach.	🟢	🟢	
Assign Skilled and Experienced Software Development Project Management Talent	Engage managers with experience and skill at the management of software development projects who will see the model development process to a successful completion.	🟢	🟢	
Verify Model	The model should be verified by including steps to demonstrate that the inspector staffing model software behaves as expected and as designed.	🟢	🟢	
Validate Model	The model should be validated by including steps to demonstrate that the model produces sufficiently accurate predictions of the workload demand, supply, and the consequences of a supply-demand imbalance.	🔴	🟡	The model's staffing projections are reviewed twice-a-year by subject-matter experts. However, FAA has not implemented performance measures to assess the model's results. FAA is considering 10 demand-driven metrics for Flight Standards, such as inspector backlog of work, but they have yet to be finalized and may not measure the model's accuracy or the consequences of staffing decisions.

Exhibit D. Completion Status: 2006 NRC Inspector Staffing Model Recommendations

NRC Report Recommendation	NRC Recommendation Description	2013 FAA Gap Analysis Report	2020 OIG Assessment of FAA's Implementation	Explanation for OIG's Assessment
FAA Must Institutionally Commit to Maintenance of the Model	The FAA must recognize and plan for continuing requirements for human and financial resources to provide proper maintenance of the model.	🟡	🟡	FAA has contracted with Volpe to maintain and update the model. However, similar to the 2013 Gap Report Study Team, we did not find formal, established criteria, like performance measures, to assess the model's output.
Improve Aircraft Certification Inspector Work Recording Systems	AIR should continue to improve the work recording systems used by AIR inspectors.	🟢	🟢	
Involve Affected Stakeholders in Aircraft Certification Model Improvement Efforts	The AIR model team should engage AIR inspectors and field managers in any improvement efforts and be receptive to their concerns.	🟢	🟢	

Source: OIG analysis

Exhibit D. Completion Status: 2006 NRC Inspector Staffing Model Recommendations

Exhibit E. Major Contributors to This Report

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Appendix. Agency Comments
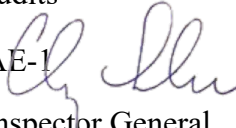
Federal Aviation Administration

Memorandum

Date: July 13, 2021

To: Matthew E. Hampton, Assistant Inspector General for Aviation Audits

From: H. Clayton Foushee, Director, Office of Audit and Evaluation, AAE-1

Subject: Federal Aviation Administration's (FAA) Response to Office of Inspector General (OIG) Draft Report: FAA Can Increase Its Inspector Staffing Model's Effectiveness by Implementing System Improvements and Maximizing Its Capabilities

The Federal Aviation Administration (FAA) agrees with OIG's draft report that the current Aviation Safety Staffing Tool and Reporting System (ASTARS) could be improved by implementing system changes and expanding capabilities. Since the 2013 OIG audit, the FAA has taken numerous steps to improve its current staffing model. The agency has fully or partially implemented 22 of the 25 recommendations made by the National Research Council by taking constructive steps to improve the model's data enhance software and simplify the model's formula to more easily calculate future inspector activities. The FAA plans to implement the remaining three recommendations by September 30, 2023.

As stated within the report, the Flight Standards Service component of the ASTARS model has operated for years with data and office configuration updates, completing forecast iterations approximately every six months. While ASTARS is a tool within the Aviation Safety organization, it is not the sole determinant for the number and placement of inspectors. The FAA uses ASTARS for macro-level guidance, which is further refined with expertise and judgment from executive management and subject matter experts (Division/Office Managers, statisticians, operations research analysts and economists) to support staffing decisions.

In 2017, the Flight Standards Service realigned from a geographic-based organization to a four-division functional-based organization that led to the development of two new models to help determine inspector staffing requirements for air carrier and general aviation operations. These models are in different stages of the data refinement and change management implementation process. Once approved and fully implemented, these models will provide increased fidelity on the number of inspectors required to support safety investigations, oversight, surveillance, and certification activities in the changing aviation environment.

Upon review of the OIG draft report, the FAA concurs with recommendations 2, 3, 5, 6, and 7, as written. The FAA plans to implement recommendations 3 and 5 by March 31, 2022; recommendations 2 and 6 by June 30, 2022; and recommendation 7 by December 31, 2022.

The agency partially concurs with recommendations 1 and 4. For recommendation 1, the FAA does not agree to compare staffing models estimates to actual staffing results. As an alternative, and consistent with position reporting contained within the Agency's Budget and Workforce Planning documents provided to Congress, we plan to compare staffing models estimates to "actual staffing level results" instead of "actual staffing results." The FAA will implement this process by June 30, 2023.

Similarly, for recommendation 4, the FAA does not agree to produce staffing estimates for "functional and field office levels" as the Aviation Safety organization is organized at the "Service and Office level." As an alternative and consistent with Agency and Department reporting documents provided to Congress, the FAA plans to produce staffing estimates at the Service and Office level by March 31, 2022.

The FAA appreciates this opportunity to offer additional perspective on the OIG draft report. Please contact H. Clayton Foushee if you have any questions or requireadditional information about these comments.

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