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TRB TRANSPORTATION RESEARCH BOARD

TRB Webinar:

Aviation Supply Chain Problems and Industry Response

August 25, 2025

12:00 – 1:30 PM

PDH Certification Information

1.5 Professional Development Hours (PDH) – see follow-up email

You must attend the entire webinar.

Questions? Contact Andie Pitchford at TRBwebinar@nas.edu

The Transportation Research Board has met the standards and requirements of the Registered Continuing Education Program. Credit earned on completion of this program will be reported to RCEP at RCEP.net. A certificate of completion will be issued to each participant. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the RCEP.

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1.5 American Institute of Certified Planners Certification Maintenance Credits

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Log into the American Planning Association website to claim your credits

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American Association of Airport Executives (AAAE) Credit Information

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Purpose Statement

This webinar will explore the extent of aircraft production problems and the various factors that have contributed to them. Presenters will share stakeholder perspectives and identify what manufacturers and governments are doing to address the problems and the impact on consumers.

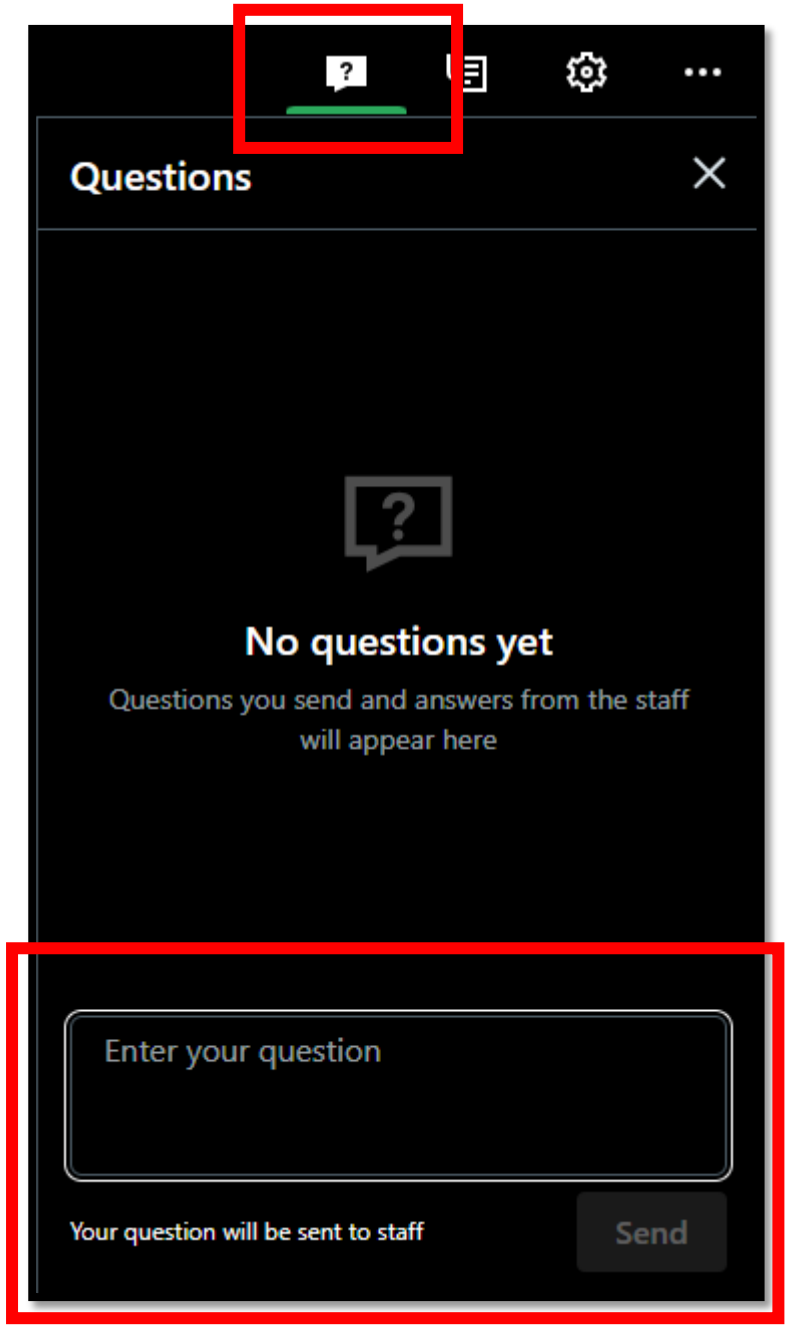
Learning Objectives

At the end of this webinar, participants will be able to:

- Understand the various factors that have contributed to the aircraft production problems
- Identify what manufacturers and governments are doing to address the problems

Questions and Answers

- Please type your questions into your webinar control panel
- We will read your questions out loud, and answer as many as time allows



Today's Presenters

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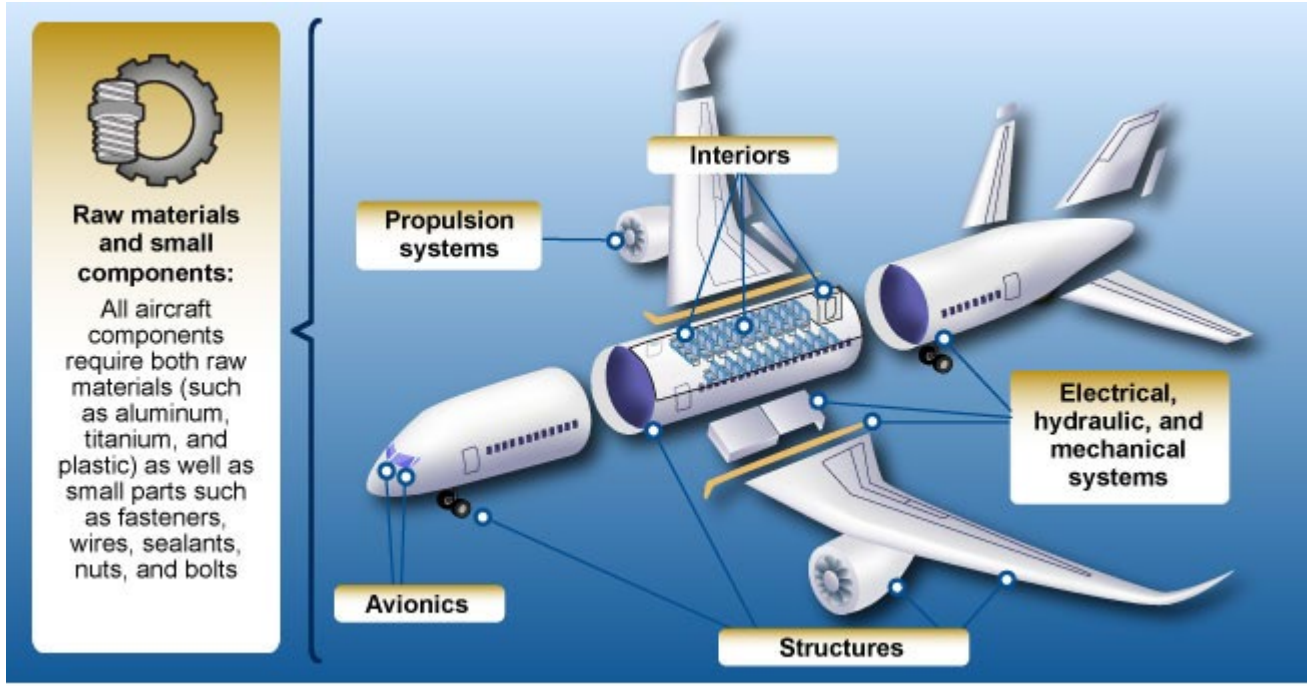
GE Aerospace

Commercial Aviation Manufacturing: Supply Chain Challenges and Actions to Address Them

Transportation Research Board 2025

See GAO-24-106493



Sources: GAO summary of Boeing and Airbus information, GAO (illustrations), and Anshuman/stock.adobe.com. | GAO-24-106493

For additional information, contact Katie Hamer, Hamerk@gao.gov or Heather Halliwell, HalliwellH@gao.gov

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- GAO—often called the “Congressional Watchdog”—is an independent, non-partisan agency that works for Congress to examine how taxpayer dollars are spent.
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Commercial Aviation Manufacturing: Supply Chain Challenges and Actions to Address Them

Last March, we issued a report on commercial aviation manufacturing in response to a request from the Chairs of the House Committee on Transportation and Infrastructure and Subcommittee on Aviation. Our report addressed 3 questions:

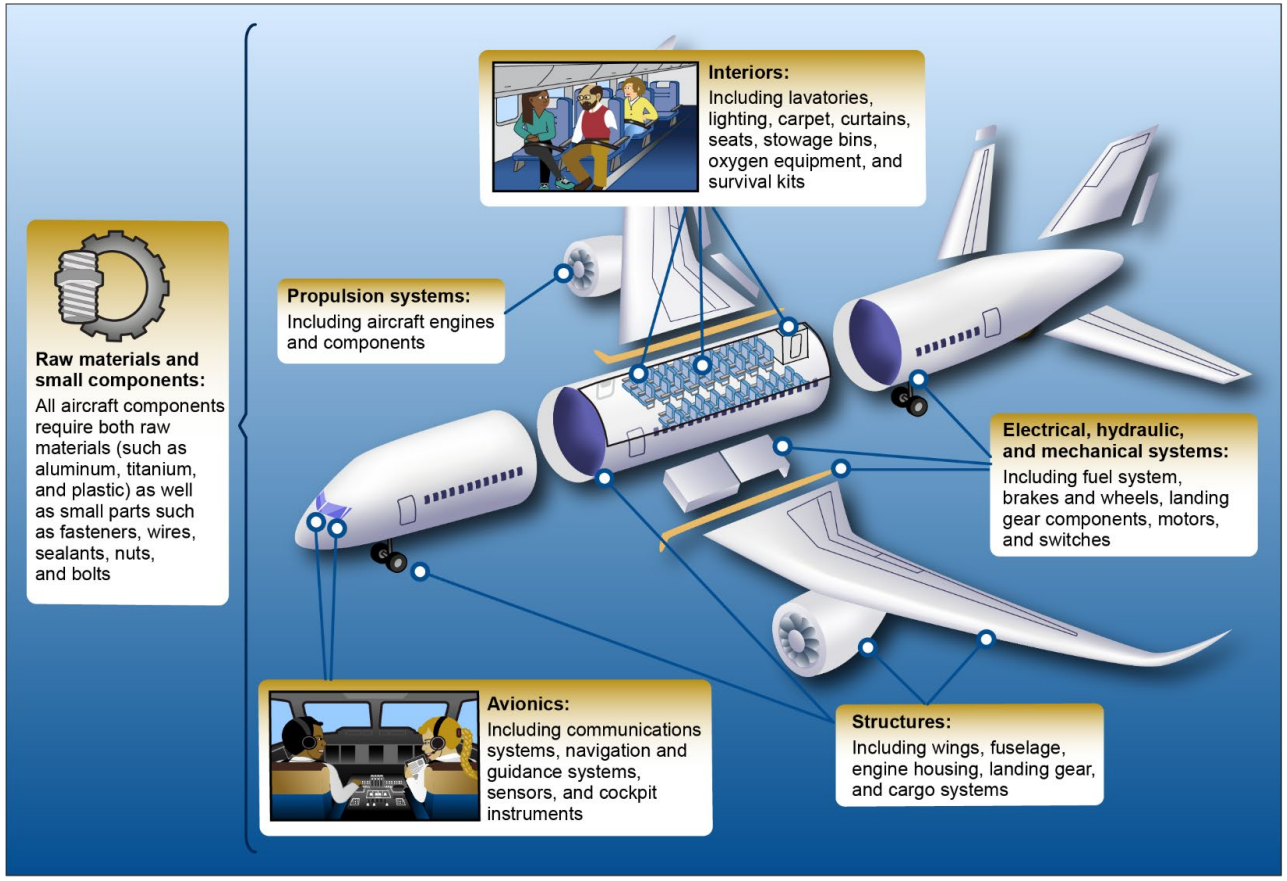
1. what is known about the demand for and production of new aircraft and parts since 2020;
2. selected manufacturers' perspectives on factors affecting production of new aircraft and parts as well as current and potential actions to mitigate these factors; and
3. how the availability of new aircraft and parts has affected airlines' operations.

GAO's Methodology

- **Data analyses:** Analyzed a wide variety of sources, including Boeing and Airbus data on orders and deliveries, Aviation Week Network data to estimate aircraft production rates, and data from the Bureau of Labor Statistics on changes in aviation manufacturing employment and material supply costs.
- **Interviews:** Interviewed selected industry stakeholders, including aerospace manufacturers, maintenance providers, airlines, industry associations, market analysts, and others.
- Additional information on our scope and methodology can be found in GAO-24-106493.

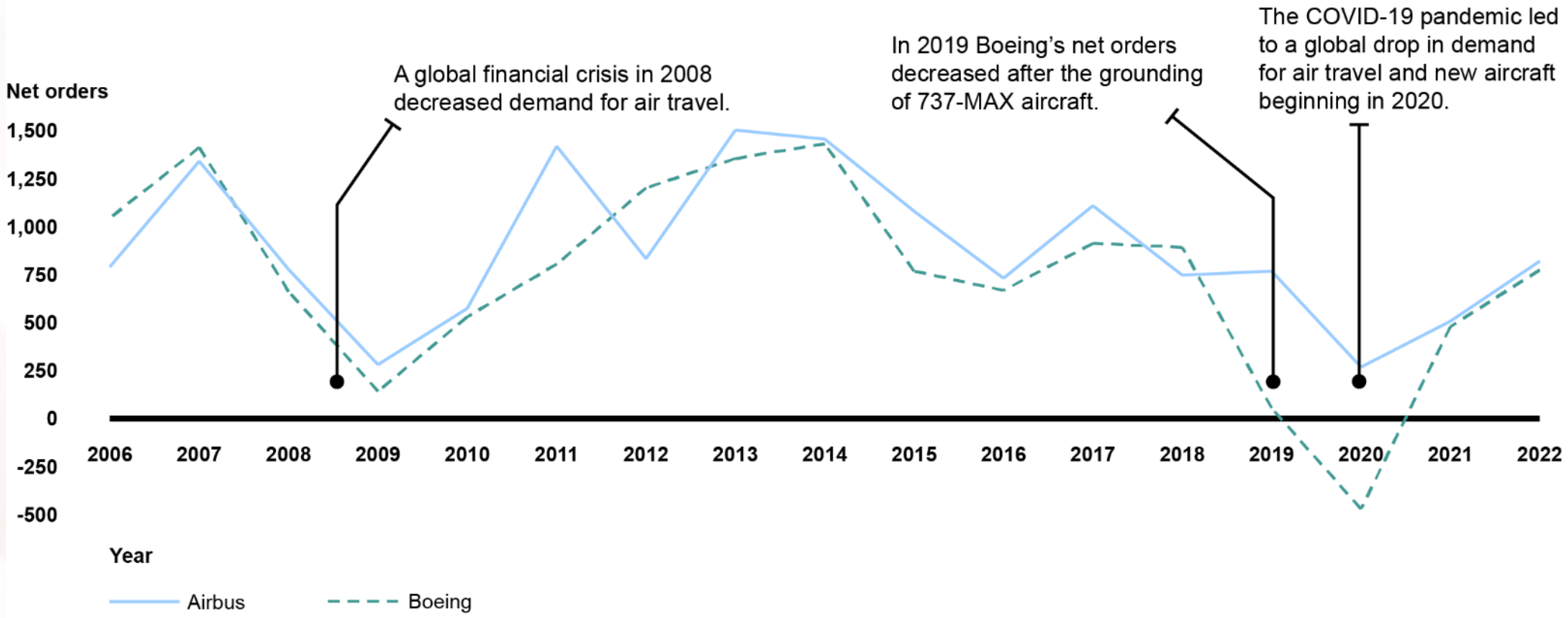
Aviation Manufacturing Industry

- Thousands of manufacturers and raw material suppliers make up the global aviation manufacturing supply chain. According to Boeing, about 700 suppliers support the 737 aircraft, which are each composed of about 2 million separate parts
- Companies include aircraft manufacturers, component manufacturers, and raw materials suppliers, and range in size and type from those producing a wide variety of aircraft components with thousands of employees to highly specialized firms with fewer than 100 employees.
- Components may be ordered months or years in advance of when they are needed.



Source: GAO summary of Boeing and Airbus information, GAO (illustrations), and Anshuman/stock.adobe.com. | GAO-24-106493

Demand for new aircraft is affected by a variety of factors

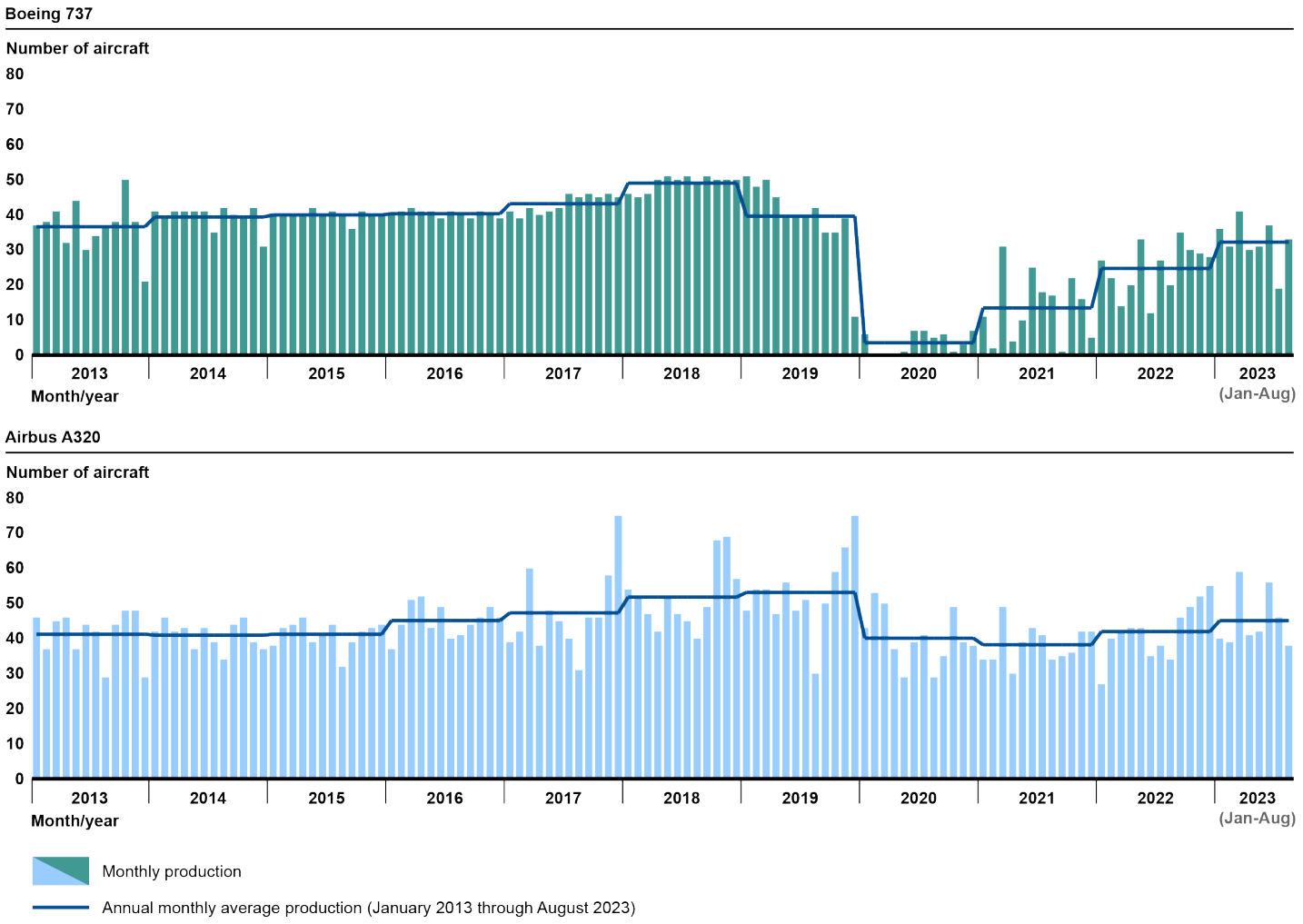


Source: GAO analysis of Federal Aviation Administration information and Boeing and Airbus data. | GAO-24-106493

Manufacturers Had Difficulty Keeping up with Rebounding Customer Demand

- Boeing and Airbus representatives reported challenges meeting production targets since demand for new aircraft returned in 2021.
  - In the near term, Boeing's production levels for 737 aircraft have been affected by the actions Boeing and FAA announced in response to the January 2024 door plug failure
- Nine of the 15 component manufacturers and raw material suppliers we interviewed told us that they either had difficulty filling, or have been unable to fill, all orders in recent years.
- Three companies said that while they had been able to fill orders through 2023, they would have trouble meeting demand if new aircraft production rates increased.

Estimated Production of Boeing 737 and Airbus A320 Aircraft, January 2013—August 2023



Source: GAO analysis of Aviation Week Network data. | GAO-24-106493

Factors Affecting Production: Difficulty Hiring

- During the COVID-19 pandemic, the industry lost many employees through layoffs, retirements, and decisions to leave the industry.
- Difficulty hiring skilled and experienced workers due to competition for workers from other industries.

- *Industry Actions:*
  - Workforce development efforts, like apprenticeship programs with local schools
  - Worker incentives, such as signing bonuses

Factors Affecting Production: Material Shortages

- Selected manufacturers said difficulty procuring materials or components affected their ability to meet demand.
  - Shortages of a broad range of items, including castings and forgings, engines, and semiconductors
  - Reliance on foreign sources vulnerable to political and environmental risks
  - Reliance on sole source suppliers
  - Increased costs for production inputs, including materials
- Industry actions:
  - Began or enhanced Supply Chain Management
  - Established dual or alternative sources
  - Increased inventory
  - Developed in-house production capacity

GAO

Supply Chain Effects on Airline Operations

- All 8 airlines we interviewed reported difficulty obtaining either new aircraft or the parts needed to maintain their fleets through 2023.
  - Challenges related to new engines and engine parts
  - Delays in maintenance/repair due to part shortages
- Supply chain delays led to changes in airline operations
  - Operating fewer flights than planned due to delays in receiving new aircraft
  - Delayed or cancelled planned expansions

Supply Chain Effects on Airline Practices

- Enhancing supply chain management: Airlines increased engagement with suppliers, such as meeting frequently, and negotiated new orders.
- Extending the life of components
  - Repairing instead of replacing
  - Increasing inspection frequency to allow airlines to safely extend the life of components
- Increasing spare parts inventories

Looking Forward

- We did not make recommendations, but described potential government actions to address stakeholder-identified challenges, including:
  - Expanding FAA programs for aviation workforce development to include manufacturing to address labor shortages
  - Establishing clearer guidance and standards for alternative manufacturing processes—such as additive manufacturing—to address supply shortages
- DOT established an Aerospace Supply Chain Resiliency Task Force in December 2023.

AIA AEROSPACE INDUSTRIES ASSOCIATION

Kelvin Stroud

Senior Director, Supply Chain Policy

8 | 25 | 2025

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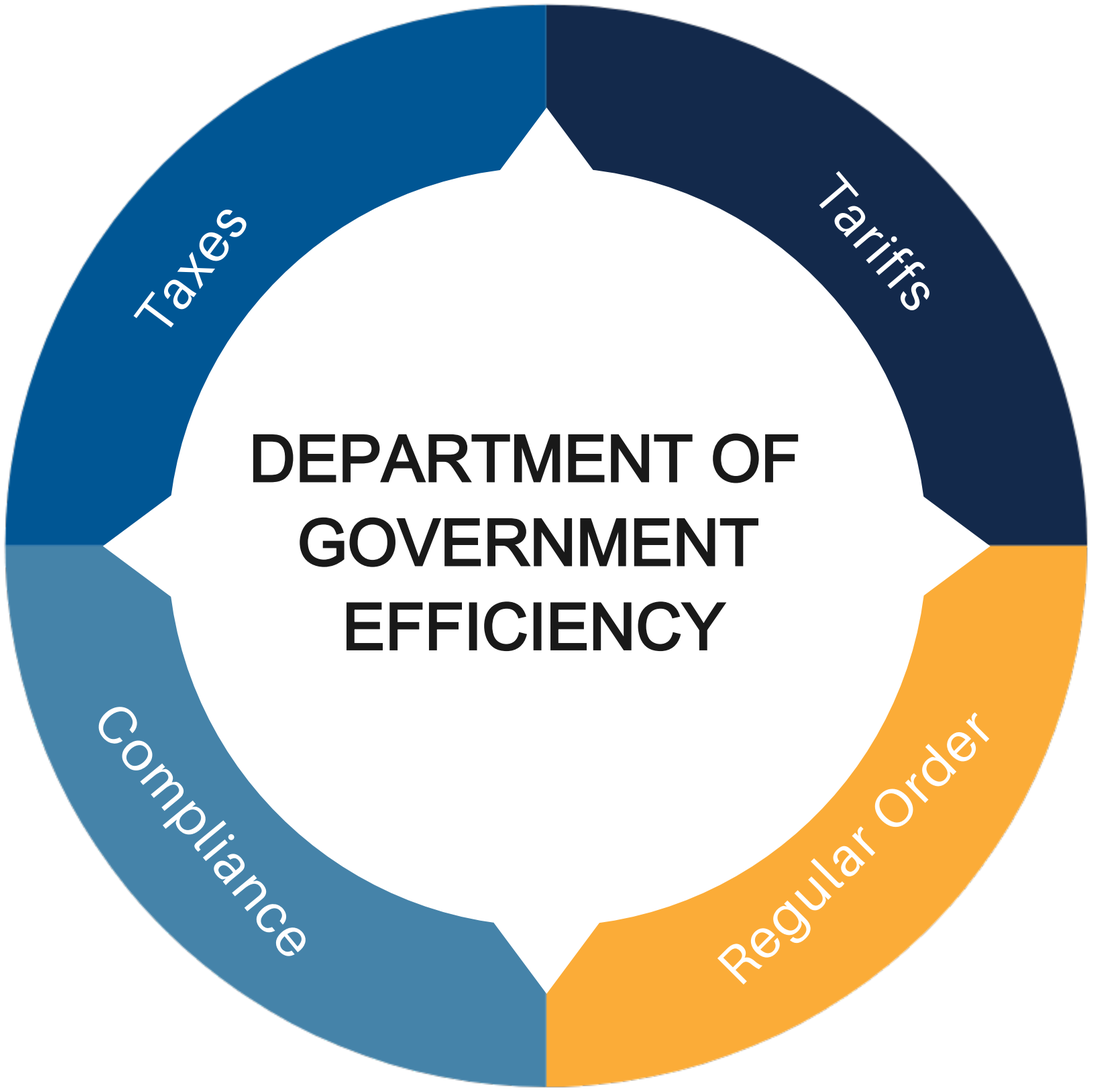
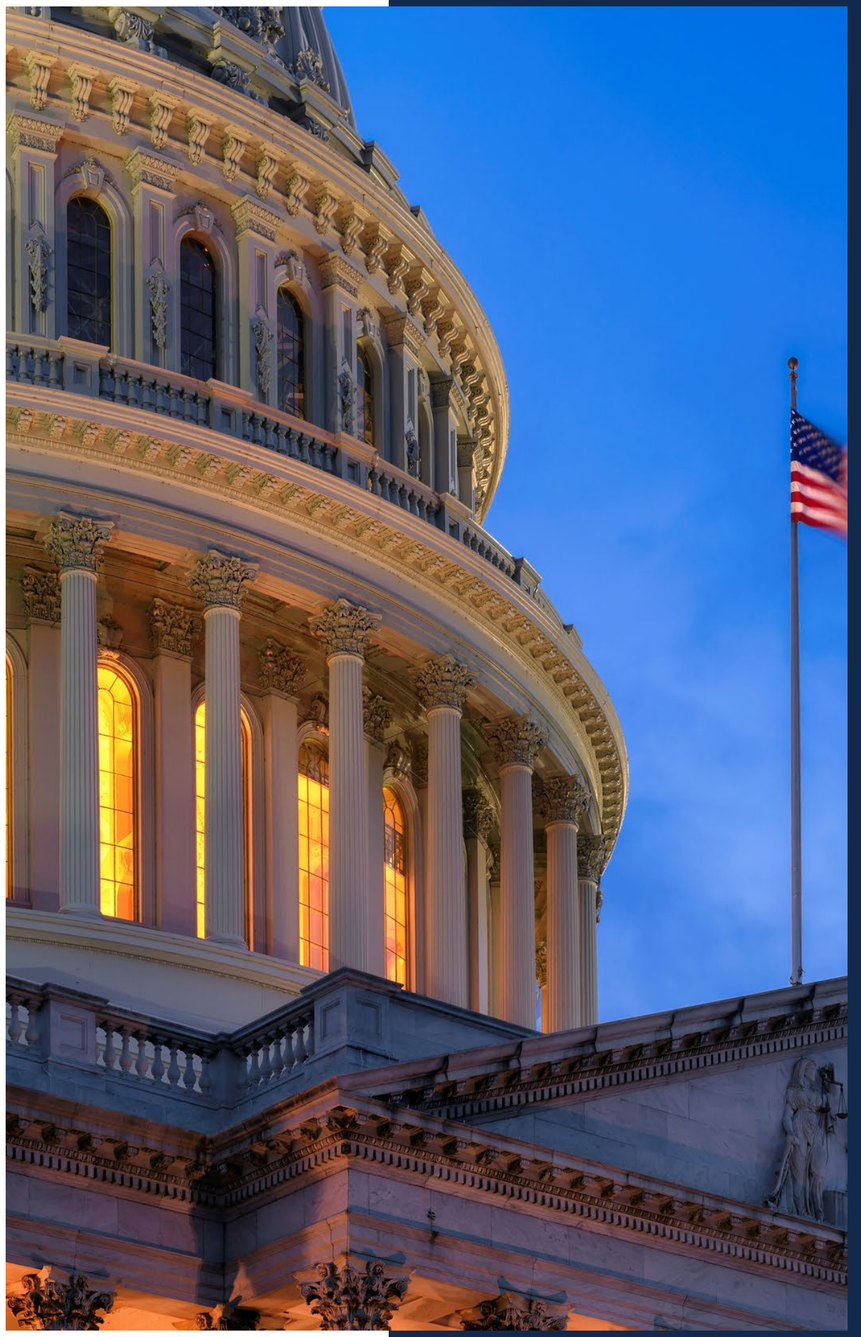
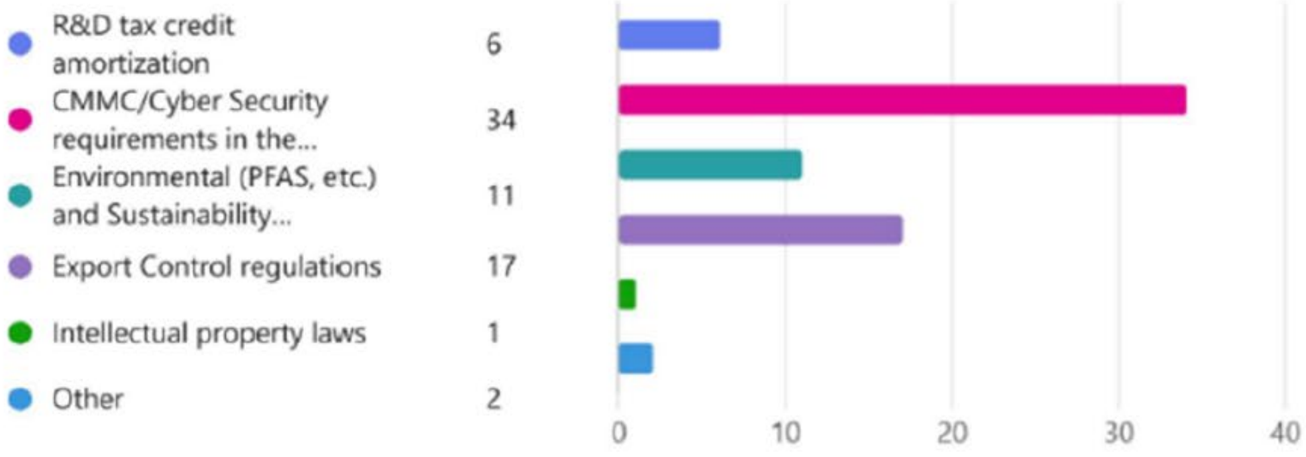
ADMINISTRATION TRANSITION





2025 SUPPLY CHAIN ENGAGEMENTS

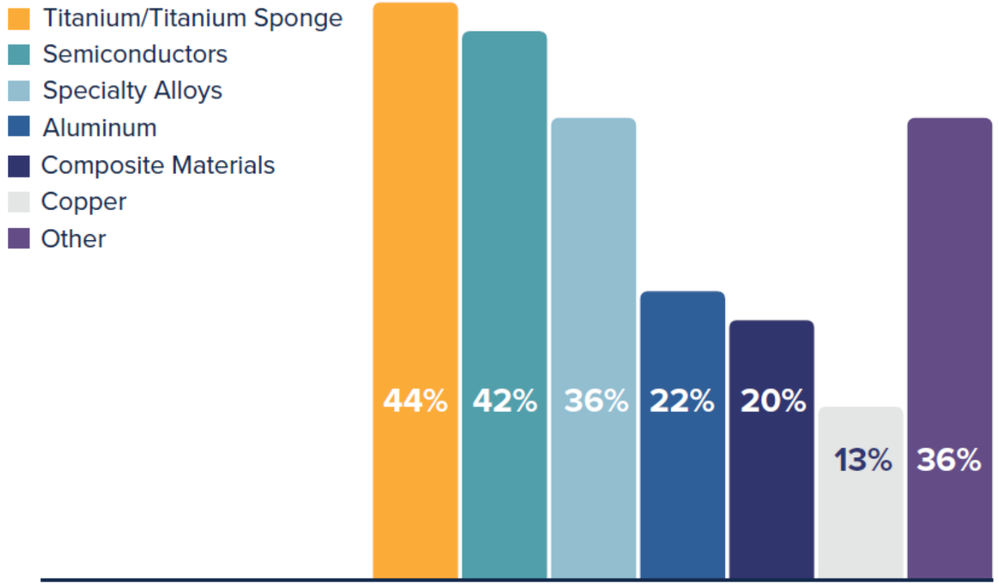
- One Annual Supply Chain Health Check
- Two Supply Chain Summits in the DMV - Spring & Fall
- Three Regional Supply Chain Roundtables
- Four Quarterly Webinars

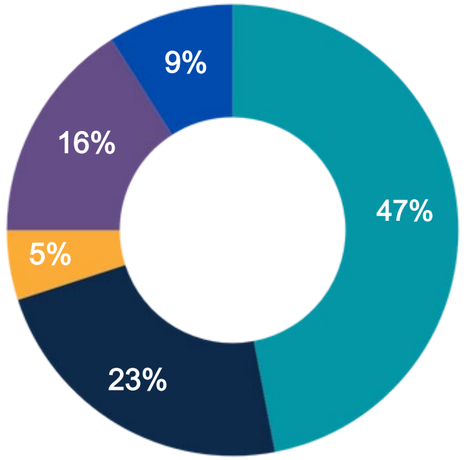


Supply Chain Health Check

Critical Materials & Minerals of Concern

AIA member companies ranked up to their top three supply chain materials or minerals they are most concerned about in the aerospace supply chain.





Technology is a priority for the industry but poses its own set of obstacles.

AIA members have voiced significant concerns about the challenges of implementing new technologies in their businesses. Including:

- Cybersecurity Challenges
- Need for Automation
- Digital Thread Adoption
- Artificial Intelligence
- Other

Retention

AIA members ranked their top challenges in retaining current workers:

- Wage competition
- Challenges with workforce perceptions of the aerospace industry
- Skilled labor retirement

Aerospace Supply Chain Resiliency Task Force Report to Congress – 2024

GUIDING PRINCIPLES & ASSUMPTIONS:

- The aerospace supply chain is vulnerable to labor shortages, availability of critical materials, and a supporting infrastructure.
- The aerospace supply chain is uniquely dependent on collaboration across regulatory entities.
- The aerospace supply chain is tied to global operations, interoperability requirements, and bilateral or multi-lateral agreements actions taken in the U.S. cannot be seen as independent of the broader global environment.

Aerospace Supply Chain Resiliency Task Force Report to Congress – 2024

RISKS:

1) Workforce – Must obtain and retain qualified individuals in the aerospace sector

(2) Critical Resources – Includes essential materials as well as the infrastructure and personnel that support the ecosystem.

3) Global Interdependence – Geopolitical uncertainty injects risk into the supply chain.

(4) Legislation, Statues, Regulation, and Policy – The aerospace sector is heavily regulated by multiple federal, state, and local agencies.

Aerospace Supply Chain Resiliency Task Force Report to Congress – 2024

CONCLUSIONS:

1) The Aerospace Supply Chain is constantly evolving, with established risks that impact the ability to efficiently operate and maintain operations.
2) Supply chain resilience does not rely on a single “fix” and cannot be fully achieved as it is not a stagnant, unmoving target.
3) The aerospace supply chain must be reviewed and analyzed - from the regulator to every regulated party - to determine where it can be more efficient and effective

2025 AIA Supply Chain Updates

- **SBIR/STTR Reauthorization Act of 2025 -** Would makes permanent and expand the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs.
- **Financing Challenges:** Unique nature of aerospace provides financing challenges.
- **CMMC Implementation:** The supply chain must be CMMC audit ready.
- **Supply Chain Health Check:** AIA is conducting a comprehensive study on strengthening the industrial base.

AIA AEROSPACE INDUSTRIES ASSOCIATION

Questions

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Aviation Supply Chain Integrity Coalition

AOG Technics and Suspected Unapproved Parts

- In summer 2023, the aviation industry discovered that a small, London-based aviation parts broker had sold thousands of aircraft engine parts using falsified documentation. AOG Technics (“AOG”), became the focus of regulators and law enforcement on both sides of the Atlantic, as aviation companies across the industry raced to track down the impacted parts.
- While the number of known engines affected was ultimately a small percentage of the global fleet, the incident demonstrated the need for additional safeguards to prevent unapproved propulsion parts in the global aviation supply chain.

Formation of the Aviation Supply Chain Integrity Coalition

- In February 2024, aerospace industry leaders from around the world formed the Aviation Supply Chain Integrity Coalition to recommend actions the industry can take to prevent unapproved propulsion parts from entering the supply chain again and to strengthen the overall integrity and safety of the supply chain.
- Former NTSB Chairman Robert L. Sumwalt and former U.S. Transportation Deputy Secretary John D. Porcari joined the effort as Coalition co-chairs.
- Founding members of the coalition included senior representatives from Airbus, American Airlines, Boeing, Delta Air Lines, GE Aerospace, Safran, StandardAero and United Airlines.

AIRBUS BOEING DELTA American Airlines

SAFRAN StandardAero UNITED GE Aerospace

Research and Investigation

- The Coalition organized its work into two phases, beginning with the research phase to investigate gaps and gather insights from experts.
- The co-chairs, members and Coalition staff interviewed 38 subject matter experts from 24 companies and associations via written questions and oral interviews.
- These experts represented industry associations, maintenance, repair and overhaul shops (MROs), engine and airframe original equipment manufacturers (OEMs), airlines, parts brokers, engine lessors, audit agencies, airframe manufacturers and accreditation organizations.
- Additionally, the Coalition visited one of the world's largest MROs to gather best practices and develop possible solutions.

Findings and Recommendations

- The Aviation Supply Chain Integrity Coalition has developed recommended actions industry can take to prevent the introduction of SUPs into the aviation propulsion supply chain, grouped in three categories:
  - Vendor accreditation,
  - Documents traceability and verification, and
  - Non-serialized parts traceability.

- Within each of these three categories, the Coalition developed recommendations that industry should strive to implement in both the short-term (12 – 24 months), the medium-term (within the next 5 years), and the long term (over 5 years) to prevent SUPs entering the aviation propulsion supply chain.

- The recommended actions are performance-based and technology-agnostic, allowing companies in the aerospace industry flexibility in achieving the outcome.

- While no single recommended action can prevent bad actors from committing fraud in the marketplace – however, taken together, the Coalition firmly believes that the actions identified in these recommendations will increase aviation safety and reduce the risk of fraud in the aviation parts supply chain.

RECOMMENDED ACTIONS

VENDOR ACCREDITATION

SHORT TERM	MEDIUM TERM	LONG TERM
Promote Industry Use of Suppliers that Meet FAA and EASA Standards	Establish Industry Oversight Body of Accreditation Organizations	Establish Database of Accredited Vendors to Verify Identities and Quality Management Standards
Establish Feedback Loop Between Parts Installers and Accreditors		

DOCUMENT TRACEABILITY & VERIFICATION

SHORT TERM	MEDIUM TERM	LONG TERM
Expand the Use of Digital Authorized Release Certificates (ARCs) and Increase the Use of Digital Authentication Tools	Establish Industry Standard Documentation Requirements to Ensure Consistency Across the Industry	Establish Voluntary Industry Database of Back-to-Birth Parts Documentation
	Digitize Existing and Past Parts-Related Documents	
	Develop and Adopt Industry-wide Use of Software Database to Verify Key Authorized Release Certificate (ARC) Fields	

NON-SERIALIZED PARTS TRACEABILITY

SHORT TERM	MEDIUM TERM	LONG TERM
Further Strengthen Training Materials, Programs, and Best Practices	Improve Real-Time Data Sharing to Identify Unapproved Parts	Development of New Technological Solutions to Improve Parts Traceability
Verification and Auditing of Scrap Material and Recycling Vendors		

Read the full report:

https://aviationsupplychainintegrity.com/

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Upcoming events for you

September 26, 2025

TRB Virtual Event: Celebrating 20 Years, How You Can Drive Airport Innovation with ACRP

https://www.nationalacademies.org/trb/events

January 11-15, 2026

2026 TRB Annual Meeting

https://trb-annual-meeting.nationalacademies.org/

ACRP 20th Anniversary

September 26th is ACRP Day!

Celebrate 20 years of industry-led research and share the ACRP resources that you value the most.

www.trb.org/ACRP/ACRP20Anniversary

Get Involved!

- Feature your airport on the interactive map
- Join the ACRP Day social event with **#ACRPImpact**
- Advance ACRP research and programs

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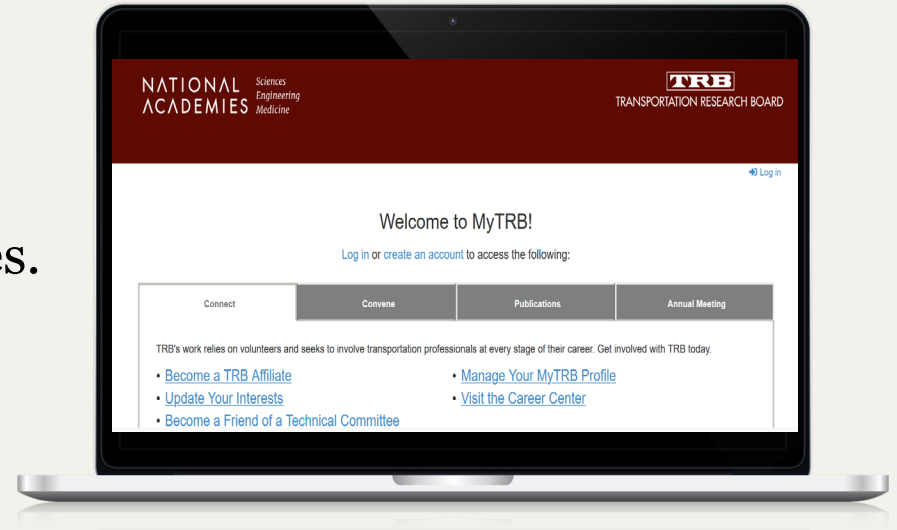

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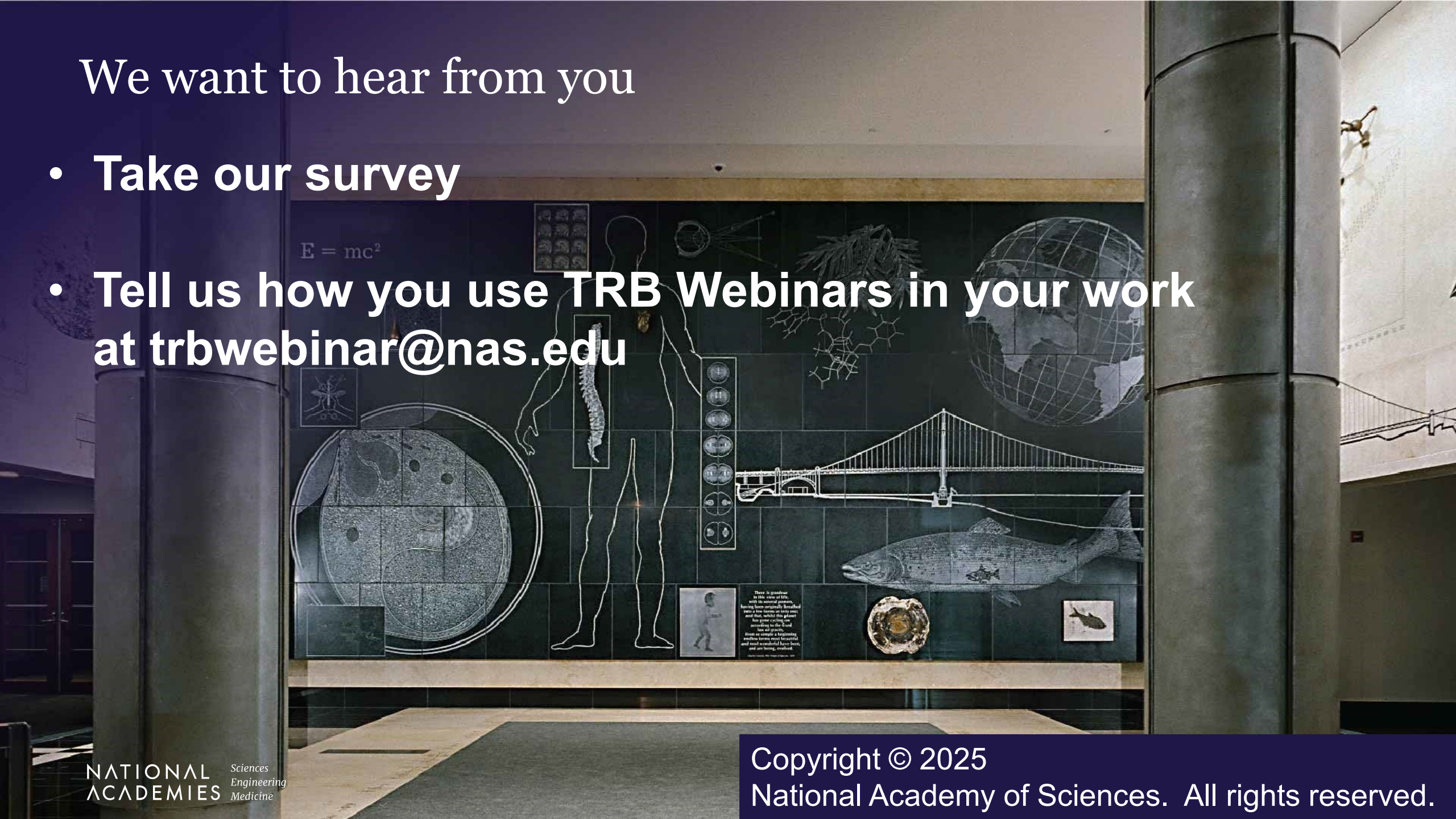

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