

WORKSHOP BOOKLET

Emerging Trends in Aviation Safety

Strategic Foresight Workshop
20 March 2023

NATIONAL
ACADEMIES

*Sciences
Engineering
Medicine*



TRANSPORTATION RESEARCH BOARD

EMERGING TRENDS IN AVIATION SAFETY

March 20, 2023 Workshop Agenda – SUBJECT TO CHANGE

Keck Building Room 100; 9:00 AM – 5:00PM

8:30 – 9:00 AM **Continental Breakfast Available**

9:00 – 9:10 AM **Opening Remarks from the Study Sponsor and Study Chair**

Ms. Kimberly Pyle, Executive Director of the Office of Accident Investigation and Prevention (AVP) at the Federal Aviation Administration (FAA), and Dr. Amy Pritchett will briefly discuss the study tasks and workshop goals.

9:10 – 9:30 AM **Icebreaker Activity**

The workshop facilitators from the Aerospace Corporation will lead the icebreaking activity.

9:30 – 10:00 AM	Overview of First Report Findings and Introduction of Case Studies for Examination
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Dr. Pritchett briefly shares the key findings from the committee's first report and discusses step changes in commercial aviation safety, which will serve as a group exercise for examining safety cases to allow for those safety changes in the national airspace system (NAS).

10:05 – 11:55 AM Facilitated Breakout Group Discussions on Safety Cases

Aerospace Corp facilitates small group discussions on the reasonable safety cases for allowing such new step changes into the NAS.

12:00 – 12:30 PM	Cross-share Breakout Team Insights and Discuss Afternoon Breakout Focus
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The workshop participants reconvene to share insights on their safety case discussions.

12:30 – 1:00 PM **Lunch Provided in Keck**

1:00 – 3:25 PM **Facilitated Breakout Group Discussions**

Group participants will be remixed for resumed facilitated discussions.

3:30 – 4:00 PM **Cross-share Breakout Team Insights**

The workshop participants reconvene to share insights on their safety case discussions.

4:00 – 4:30 PM Enterprise Modeling Discussion Led by Aerospace Corp

4:30 – 5:00 PM **Concluding Discussions Led by Study Chair**

5:00 PM **Workshop Adjourns**

EMERGING TRENDS IN AVIATION SAFETY

Statement of Task

In response to a request from Congress, this project will “identify, categorize, and analyze emerging safety trends in air transportation.” The committee will review data and analyses of all relevant sources of information, such as operational data being used by the Federal Aviation Administration (FAA) and the air transport industry to monitor for potential safety concerns; government and industry voluntary aviation safety reporting systems; FAA’s annual safety culture assessment; and other sources the committee deems appropriate, including National Transportation Safety Board accident investigations; FAA investigations of accidents and incidents; air carrier incidents and safety indicators; and international investigations of accidents and incidents, including information from foreign authorities and the International Civil Aviation Organization. The committee will assess whether these available sources of information are being analyzed in ways that can help identify emerging safety risks as the aviation system evolves and whether other information should be collected and analyzed for this purpose, such as data on accident precursors. The committee may engage in its own empirical analyses of databases.

The project will focus primarily on commercial air transportation sector, but will also include other current and prospective users of the national airspace system that could pose risks to commercial aviation. The committee will draw on the results of FAA’s annual internal safety culture assessments and also advise the agency on data and approaches for assessing safety culture to assure that FAA is identifying emerging risks to commercial aviation and sharing that information throughout the agency and with the public.

The project will produce an initial report in mid-2022, biennial reports through 2030, and a final report in 2031. It is expected that the committee’s first report will include a high-level assessment of the efficacy of domestic public and private sources of data and information for identifying and assessing emerging risks and advise on data gaps that need filling. The first report is also expected to include the approach the committee intends to pursue in subsequent biennial reports to assess the robustness of domestic and international data sources and processes for analyzing them for the purpose of identifying emerging risks to commercial air transportation. In addition to documenting its study findings in each report, the committee may offer advice to Congress, FAA, industry, and others on options for improving means for identifying, monitoring, understanding, and addressing emerging aviation safety risks, including supplementing, improving, and harmonizing existing databases, reporting systems, and analysis methods.

During the second phase of the study to produce its first biennial report, the committee may employ strategic foresight method, such as horizon scanning, to demonstrate alternative strategies for identifying emerging trends in aviation safety. While this exercise may reveal previously unidentified or overlooked hazards in commercial aviation, its primary aim will be to reveal whether such methods, including those that seek broad input from diverse parties, have the potential to be applied successfully for this purpose. The study committee is also expected to continue with its in-depth assessment of existing domestic and international data sources and analytic processes as means for identifying emerging risks to commercial air transportation.

EMERGING TRENDS IN AVIATION SAFETY

From the Consolidated Appropriations Act, 2021

SEC. 132. EMERGING SAFETY TRENDS IN AVIATION.

(a) **General** — Not later than 180 days after the date of enactment of this title, the Administrator shall enter into an agreement with the Transportation Research Board for the purpose of developing an annual report identifying, categorizing, and analyzing emerging safety trends in air transportation.

(b) **Factors** — The emerging safety trends report should be based on the following data:

- (1) The National Transportation Safety Board's investigation of accidents under section 1132 of title 49, United States Code 554.
- (2) The Administrator's Investigations of accidents under section 40113 of title 49, United States Code.
- (3) Information provided by air operators pursuant to safety management systems.
- (4) International investigation of accidents and incidents, including reports, data, and information from foreign authorities and ICAO.
- (5) Other sources deemed appropriate for establishing emerging safety trends in the aviation sector, including the FAA's annual safety culture assessment required under subsection (c)

(c) **Safety Culture Assessment** - The Administrator shall conduct an annual safety culture assessment through fiscal year 2031, which shall include surveying all employees in the FAA's Aviation Safety organization (AVS) to determine the employees' collective opinion regarding, and to assess the health of, AVS' safety culture and implementation of any voluntary safety reporting program.

(d) **Existing Reporting System** – The Executive Director of the Transportation Research Board, in consultation with the Secretary of Transportation and Administrator, may take into account and, as necessary, harmonize data and sources from existing reporting systems within the Department of Transportation and FAA.

(e) **Biennial Report To Congress** – One year after the Administrator enters into the agreement with the Transportation Research Board as set forth in subsection (a) and biennially thereafter through fiscal year 2031, the Executive Director, in consultation with the Secretary and Administrator, shall submit to the congressional committees of jurisdiction a report identifying the emerging safety trends in air transportation.

About The Transportation Research Board

The **Transportation Research Board** is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. The mission of the Transportation Research Board is to provide leadership in transportation improvements and innovation through trusted, timely, impartial, and evidence-based information exchange, research, and advice regarding all modes of transportation. The Board's varied activities annually engage about 8,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state departments of transportation, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

Learn more about the Transportation Research Board at www.TRB.org.

About Consensus Study Reports

Consensus Study Reports published by the National Academies of Sciences, Engineering, and Medicine document the evidence-based consensus on the study's statement of task by an authoring committee of experts. Reports typically include findings, conclusions, and recommendations based on information gathered by the committee and the committee's deliberations. Each report has been subjected to a rigorous and independent peer-review process and it represents the position of the National Academies on the statement of task.

Statement on Diversity, Equity, and Inclusion

The National Academies of Sciences, Engineering, and Medicine value diversity in our members, volunteers, and staff and strive for a culture of inclusion in our workplace and activities. Convening a diverse community to exchange ideas and perspectives enhances the quality of our work and increases our relevance as advisers to the nation about the most complex issues facing the nation and the world.

To promote diversity and inclusion in the sciences, engineering, and medicine, we are committed to increasing the diversity of the National Academies' staff, members, and volunteers to reflect the populations we serve. We pledge to cultivate an environment and culture that promotes inclusion and values respectful participation of all individuals who help advance the mission of the institution.

Committee on Emerging Trends in Aviation Safety

Chair: Amy Ruth Pritchett

*Professor and Head of the Department of Aerospace Engineering
Pennsylvania State University*

Committee Members

Cody Fleming

*Associate Professor of Mechanical Engineering
Iowa State University*

R. John Hansman, Jr.

*T. Wilson Professor of Aeronautics and
Astronautics
Air Transportation
Massachusetts Institute of Technology*

Christopher Hart

*Former Chairman
National Transportation Safety Board*

Margaret T. Jenny

*Former President
Radio Technical Commission for Aeronautics*

Paul McCarthy

*Former Vice President, Technical
International Federation of Air Line Pilot's
Associations*

William Rouse

*Research Professor
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*Associate Vice Chancellor for National Security
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