118TH CONGRESS
1st Session
HOUSE OF REPRESENTATIVES
REPT. 118–139
Part 1

FAA RESEARCH AND DEVELOPMENT ACT OF 2023

JULY 11, 2023.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. LUCAS, from the Committee on Science, Space, and Technology, submitted the following

R E P O R T

[To accompany H.R. 3559]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 3559) to provide for Federal Aviation Administration research and development, and for other purposes, having considered the same, reports favorably thereon with an amendment and recommends that the bill as amended do pass.

CONTENTS

The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "FAA Research and Development Act of 2023".

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTRATOR.—The term "Administrator" means the Administrator of the Federal Aviation Administration.

(2) APPROPRIATE COMMITTEES OF CONGRESS.—The term "appropriate committees of Congress" means the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.

(3) FAA.—The term "FAA" means the Federal Aviation Administration.

(4) NASA.—The term "NASA" means the National Aeronautics and Space Administration.

(5) SECRETARY.—The term "Secretary" means the Secretary of Transportation.

SEC. 3. AUTHORIZATION OF APPROPRIATIONS.

Subsection (a) of section 48102 of title 49, United States Code, is amended—

(1) in paragraph (14), by striking "and";

(2) in paragraph (15) by striking the period at the end and inserting a semicolon; and

(3) by adding at the end the following new paragraphs:

"(16) $255,130,000; for fiscal year 2024;

"(17) $261,000,000 for fiscal year 2025;

"(18) $267,000,000 for fiscal year 2026;

"(19) $273,000,000 for fiscal year 2027; and

"(20) $279,000,000 for fiscal year 2028.".

TITLE I—FAA RESEARCH AND DEVELOPMENT ORGANIZATION

SEC. 101. REPORT ON IMPLEMENTATION; FUNDING FOR SAFETY RESEARCH AND DEVELOPMENT.

Not later than one year after the date of the enactment of this Act, the Comptroller General of the United States shall submit to the appropriate committees of Congress a report on the allocation of funding pursuant to section 48102 of title 49, United States Code, to the Secretary of Transportation to conduct civil aviation research and development and to assess the implementation of section 48102(b)(2) of such title.

TITLE II—FAA RESEARCH AND DEVELOPMENT ACTIVITIES

SEC. 201. AVIATION FUEL RESEARCH, DEVELOPMENT, AND USAGE.

(a) ROADMAP.—Not later than nine months after the date of the enactment of this Act, the Secretary of Transportation shall coordinate with the Administrator of

NASA, the Secretary of Energy, and the Administrator of the Environmental Protection Agency, and consult relevant stakeholders, including those in industry and academia, to prepare and submit to the appropriate committees of Congress a coordinated research and development roadmap to safely eliminate the use of leaded aviation fuel in existing and future certified piston-engine aircraft. Such roadmap shall—

(1) identify activities to accelerate the development, testing, and certification of safe and lead-free fuel for use in general aviation aircraft, including requisite airport refueling infrastructure; and

(2) consider the feasibility of widespread use of such safe and lead-free aviation fuel by not later than 2028.

(b) PARTNERSHIP WITH PRIVATE INDUSTRY.—The Administrator shall coordinate with industry and pilot operators regarding research programs for mass production and distribution of unleaded aviation gasoline for market viability engine safety, and define criteria to explore incentive programs to reduce lead emissions for communities in need.

SEC. 202. CONTINUOUS LOWER ENERGY, EMISSION, AND NOISE (CLEEN).

The Administrator shall consider expanding the CLEEN program under section 47511 of title 49, United States Code, and broadening eligibility for the CLEEN program to new entrants to the aviation system.

SEC. 203. STRATEGY ON HYDROGEN AVIATION RESEARCH AND DEVELOPMENT.

(a) IN GENERAL.—The Administrator, in consultation with the Administrator of NASA and the heads of other relevant Federal agencies, shall lead the development of a research and development strategy on the safe use of hydrogen as part of a sustainable future for aviation. Such strategy shall consider the following:

(1) The feasibility, opportunities, challenges, and pathways toward the potential and safe uses of hydrogen in aviation.

(2) The use of hydrogen in addition to research and development efforts, including electrification, operational efficiencies and other alternatives to traditional aviation fuel.

(b) TRANSMITTAL.—Not later than one year after the date of the enactment of the Act, the Administrator shall transmit to the appropriate committees of Congress the research and development strategy required under subsection (a).

(c) RESEARCH AND DEVELOPMENT.—Based on the results of the research and development strategy under subsection (a), the Administrator, in coordination with the Administrator of NASA, may conduct research and development activities into the following:

(1) The qualification of hydrogen aviation fuel.

(2) The safe transition to such fuel for aircraft.

(3) The advancement of certification efforts for such fuel.

(4) Risk mitigation measures for the use of such fuel in aircraft systems, including propulsion and storage systems.

SEC. 204. REPORT ON FUTURE ELECTRIC GRID RESILIENCY.

Not later than two years after the date of the enactment of this Act, the Administrator, in coordination with the Secretary of Energy, shall submit to the appropriate committees of Congress a report on the model use of the electrical grid to support future electric advanced air mobility, including cost, challenges, and opportunities for clean generation of electricity relating to such support.

SEC. 205. AIR TRAFFIC SURVEILLANCE OVER OCEANS AND OTHER REMOTE LOCATIONS.

(a) AIR TRAFFIC SURVEILLANCE OVER OCEANS.—Subject to the availability of appropriations for such purpose, the Administrator, in consultation with the Administrator of NASA and the heads of other relevant Federal agencies, shall carry out research, development, demonstration, and testing on civilian air traffic surveillance over oceans and other remote locations.

(b) REQUIREMENTS.—In carrying out the research, development, demonstration, and testing under subsection (a), the Administrator shall—

(1) consider the need for international interoperability of technologies, data, operations, and air traffic control systems;

(2) examine the status of using air traffic surveillance technologies, including space-based Automatic Dependent Surveillance-Broadcast, to facilitate the implementation of minimal separation standards over United States-controlled oceanic airspace;

(3) identify mitigating approaches to reducing any operational challenges, associated costs, or workload impacts; and

(4) use testing, data collection, evaluation, and analysis on the use of air traffic surveillance technologies, including space-based Automatic Dependent Sur-

veillance-Broadcast, to support the activities described in paragraphs (1) through (3).

(c) PILOT PROGRAM.—The Administrator may carry out a pilot program to test and evaluate air traffic surveillance equipment over United States-controlled oceanic airspace and other remote locations.

(d) REPORT.—Not later than one year after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the activities carried out under this section.

SEC. 206. UTILIZATION OF SPACE-BASED ASSETS TO IMPROVE AIR TRAFFIC CONTROL AND AVIATION SAFETY.

(a) IN GENERAL.—Subject to the availability of appropriations for such purpose, the Administrator, in coordination with the Administrator of NASA, and in consultation with industry stakeholders, shall carry out research, development, and testing of the use of air traffic Space-Based Automatic Dependent Surveillance-Broadcast (ADS-B) data.

(b) RESEARCH ACTIVITIES.—In carrying out the research, development, and testing under subsection (a) the Administrator shall focus on the following:

(1) Monitoring and automatically reporting air turbulence events.

(2) Providing space-based multilateration surveillance.

(3) Identifying global positioning system (GPS) and global navigation satellite system (GNSS) disruptions affecting air traffic services and assessing the impact of such events on the safety of air traffic and the National Airspace System.

(4) Evaluating the feasibility of implementing and using aviation safety technologies and systems using space-based Automatic Dependent Surveillance-Broadcast data.

(c) REPORT.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall provide to the appropriate committees of Congress a report on the research and development under subsection (a) and the activities researched pursuant to subsection (b).

SEC. 207. AVIATION WEATHER TECHNOLOGY REVIEW.

(a) REVIEW.—The Administrator, in consultation with the Administrator of the National Oceanic and Atmospheric Administration, shall conduct a review of current and planned research, modeling, and technology capabilities that have the potential to more accurately detect and predict weather impacts to aviation, including for unmanned aircraft systems and advanced air mobility operations, inform how advanced predictive models can enhance aviation operations, and increase national airspace system safety and efficiency.

(b) REPORT.—Not later than one year after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report containing the results of the review conducted under subsection (a).

SEC. 208. AIR TRAFFIC SURFACE OPERATIONS SAFETY.

(a) RESEARCH.—Subject to the availability of appropriations for such purpose, the Administrator, in consultation with the Administrator of NASA and the heads of other appropriate Federal agencies, shall continue to carry out research on technologies and operations to enhance air traffic surface operations safety.

(b) REQUIREMENTS.—The research program under subsection (a) shall examine the following:

(1) The safety of current air traffic control operations related to air traffic surface operations.

(2) Emerging in-cockpit technologies to enhance ground situational awareness.

(3) Emerging technologies to enhance air traffic control situational awareness.

(4) Air traffic surface operations safety for diverse advanced air mobility operations.

(5) Safety and operational data needed to inform current and future safety programs on advanced air mobility vehicles.

(6) Economic benefits of utilizing existing airport infrastructure for use in advanced air mobility operations.

(c) REPORT.—Not later than 18 months after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the research carried out under this section, including regarding the transition into operational use of such research.

SEC. 209. AIRPORT AND AIRFIELD PAVEMENT TECHNOLOGY RESEARCH PROGRAM.

Section 744 of the FAA Reauthorization Act of 2018 (Public Law 115–254; 49 U.S.C. 44505 note) is amended—

(1) in paragraph (3), by striking "and";

(2) in paragraph (4), by striking "durable airfield pavements." and inserting "resilient and sustainable airfield and vertiport pavements; and"; and

(3) by adding at the end the following new paragraph:

"(5) develop sustainability and resiliency guidelines to improve long-term pavement performance and reduce carbon emissions.".

SEC. 210. TECHNOLOGY REVIEW OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TECHNOLOGIES.

(a) REVIEW.—The Administrator shall conduct a review of current and planned artificial intelligence and machine learning technologies to improve airport efficiency and safety.

(b) SUMMARIES.—The review conducted under subsection (a) shall include examination of the application of artificial intelligence and machine learning technologies to the following:

(1) Jet bridges.

(2) Airport service vehicles on airport movement areas.

(3) Aircraft taxi.

(4) Any other areas the Administrator determines necessary to help improve airport efficiency and safety.

(c) REPORT.—Not later than one year after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report containing the results of the review conducted under subsection (a). The report shall also include an examination of China's domestic application of artificial intelligence and machine learning technologies identified under subsection (b).

SEC. 211. RESEARCH PLAN FOR COMMERCIAL SUPERSONIC RESEARCH.

Not later than one year after the date of the enactment of this Act, the Administrator, in consultation with the Administrator of NASA and industry, shall submit to the appropriate committees of Congress a comprehensive research plan to build on existing research and development activities and identify any further research and development needed to inform the development of Federal and international policies, regulations, standards, and recommended practices relating to the certification and safe and efficient operation of civil supersonic aircraft and supersonic overland flight.

SEC. 212. ELECTROMAGNETIC SPECTRUM RESEARCH AND DEVELOPMENT.

(a) IN GENERAL.—The Administrator shall conduct research, engineering, and development related to the effective and efficient use and management of radio frequency spectrum in the civil aviation domain, including for aircraft, unmanned aircraft systems, and advanced air mobility. Such research, engineering, and development shall, at a minimum, address the following:

(1) How reallocation or repurposing of radio frequency spectrum adjacent to spectrum allocated for communication, navigation, and surveillance may impact the safety of civil aviation.

(2) The effectiveness of measures to identify risks, protect, and mitigate against spectrum interference in frequency bands used in civil and commercial aviation operations to ensure public safety.

(3) The implications, including risks, of new or emerging technologies or other factors on the environment for radio frequency spectrum interference.

(4) How various new or emerging technologies may enable improvements in the prevention of, mitigation of, or resilience to interference, including the ability to sense the spectrum environment and dynamically change frequency to ensure resilient operations.

(b) REPORT.—Not later than one year after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report containing the results of the research, engineering, and development conducted under subsection (a).

SEC. 213. AVIATION STRUCTURES, MATERIALS, AND ADVANCED MANUFACTURING RESEARCH AND DEVELOPMENT.

(a) IN GENERAL.—Using the amounts available under section 48102(a) of title 49, United States Code, the Administrator, in coordination with the Director of the National Institute of Standards and Technology, shall carry out a research and development program for advancing aviation structures, materials, and manufacturing for the safe use in and on aircraft.

(b) INCLUSION.—The program under subsection (a) shall, to the extent practicable, include research and development relating to the following:

(1) Metallic and non-metallic based additive materials and processes, composites, and other advanced materials.

(2) Process development for the development of design and manufacturing standards for aviation structures, materials, and additive manufacturing.

(3) Improving certification efficiency of aviation structures, materials, and additively manufactured aviation products and components.

(4) Evaluating long-term material and structural behavior and associated maintenance, including support for fatigue life determination, structural changes related to fatigue, thermal, corrosive environments, and expected maintenance of such materials, including recommended repair techniques.

(5) Partnering with commercial entities to mature and certify, as appropriate, the following capabilities for use in aircraft manufacturing:

(A) Additive manufacturing, including large-scale additive manufacturing.

(B) Aviation structures.

(C) Advanced materials capabilities, including the development and qualification of new material chemistries.

(6) Inspection and quality assurance technologies for use with complex geometries enabled by advanced manufacturing methods.

(c) REPORT.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall provide to the appropriate committees of Congress a report on the findings of the research under subsection (a).

SEC. 214. RESEARCH PLAN ON THE REMOTE TOWER PROGRAM.

(a) IN GENERAL.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a comprehensive plan for research, development, testing, and evaluation needed to mature remote tower technology and provide a strategic roadmap to support standards development, validation, and operational certification of such technology.

(b) CONSIDERATIONS.—As part of the plan required under subsection (a), the Administrator should consider the use of remote tower technologies for advanced air mobility operations.

SEC. 215. AIR TRAFFIC CONTROL TRAINING.

(a) RESEARCH.—Subject to the availability of appropriations for such purpose, the Administrator shall carry out a research program to evaluate opportunities to modernize, enhance, and streamline training time to become a Certified Professional Controller.

(b) REQUIREMENTS.—The research under subsection (a) shall—

(1) assess the use of advanced technologies, such as artificial intelligence, machine learning, adaptive computer-based simulation, virtual reality, or augmented reality, to enhance controller knowledge retention, improve performance, and improve the effectiveness of training time;

(2) develop a timeline to deploy proven advanced technologies and associated processes for accreditation in training programs and training facilities within the national airspace system; and

(3) include collaboration with labor organizations and other stakeholders.

(c) REPORT.—Not later than one year after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the findings of the research under subsection (a).

SEC. 216. REPORT ON AVIATION CYBERSECURITY DIRECTIVES.

Not later than 180 days after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the status of the FAA's implementation of section 2111 of the FAA Extension, Safety, and Security Act of 2016 (Public Law 114–190; 49 U.S.C. 44903 note; relating to the development of a comprehensive and strategic aviation cybersecurity framework and establishment of a research and development plan to mitigate cybersecurity risks in the National Airspace System). The report, at minimum, shall include the following:

(1) A description of the FAA's progress in developing, implementing, and updating such framework.

(2) A description of prioritized research and development activities for the most needed improvements, with target dates, to safeguard the National Airspace System.

(3) An explanation for any delays or challenges in so implementing such section.

SEC. 217. RULE OF CONSTRUCTION REGARDING COLLABORATIONS.

Nothing in this Act may be construed as modifying or limiting existing collaborations, or limiting potential engagement on future collaborations, between the Administrator, stakeholders, and labor organizations, including the exclusive bargaining representative of air traffic controllers certified under section 7111 of title 5, United States Code, pertaining to Federal Aviation Administration research, development, demonstration, and testing activities.

SEC. 218. TURBULENCE RESEARCH AND DEVELOPMENT.

(a) IN GENERAL.—Subject to the availability of appropriations for such purpose, the Administrator, in collaboration with the Administrator of the National Oceanic and Atmospheric Administration, and in consultation with the Administrator of NASA, shall carry out applied research and development to—

(1) enhance the monitoring and understanding of severe turbulence, including clear-air turbulence; and

(2) inform the development of measures to mitigate safety impacts on crew and the flying public that may result from severe turbulence.

(b) RESEARCH AND DEVELOPMENT ACTIVITIES.—In conducting the research and development on severe turbulence in accordance with subsection (a), the Administrator shall—

(1) establish processes and procedures for comprehensive and systematic data collection through both instrumentation and pilot reporting, of severe turbulence, including clear-air turbulence;

(2) establish measures for storing and managing such data collection;

(3) support measures for monitoring and characterizing incidents of severe turbulence;

(4) consider relevant existing research and development from other entities, including Federal departments and agencies, academia, and the private sector; and

(5) carry out research and development—

(A) to understand the impacts of climate change and other factors on the nature of turbulence, including severe turbulence and clear-air turbulence;

(B) to enhance turbulence forecasts for flight planning and execution, seasonal predictions for schedule and route-planning, and long-term projections of severe turbulence, including clear-air turbulence; and

(C) on other subject matters areas related to severe turbulence, as determined by the Administrator; and

(6) support the effective transition of the results of research and development to operations, where appropriate.

(c) NO DUPLICATION.—The Administrator shall ensure that research and development activities under this section do not duplicate other Federal programs relating to turbulence.

(d) TURBULENCE DATA.—

(1) COMMERCIAL PROVIDERS.—In conducting research and development activities under subsection (b), the Administrator may enter into agreements with commercial providers for the following:

(A) The purchase of turbulence data.

(B) The placement on aircraft of instruments relevant to understanding and monitoring turbulence.

(2) DATA ACCESS.—The Administrator shall make the data collected pursuant to subsection (b) widely available and accessible to the scientific research, user, and stakeholder communities, including the Administrator of the National Oceanic and Atmospheric Administration, to the greatest extent practicable and in accordance with Federal Aviation Administration data management policies.

(e) REPORT ON TURBULENCE RESEARCH.—Not later than 15 months after the date of the enactment of this Act, the Administrator, in collaboration with the Administrator of the National Oceanic and Atmospheric Administration, shall submit to the appropriate committees of Congress a report that—

(1) details the activities conducted under this section, including how the research and development activities under subsection (b) have contributed to the goals specified in subsection (a);

(2) assesses the current state of scientific understanding of the causes, occurrence rates, and past and projected future trends in occurrence rates of severe turbulence, including clear-air turbulence;

(3) describes the processes and procedures for collecting, storing, and managing, data in pursuant to subsection (b);

(4) assesses—

(A) the use of commercial providers pursuant to subsection (d)(1); and

(B) the need for any future Federal Government collection or procurement of data and instruments related to turbulence, including an assessment of costs;

(5) describes how such data will be made available to the scientific research, user, and stakeholder communities; and

(6) identifies future research and development needed to inform the development of measures to predict and mitigate the safety impacts that may result from severe turbulence, including clear-air turbulence.

SEC. 219. RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAMS.

(a) IN GENERAL.—The Administrator shall carry out research, development, testing, evaluation, and demonstration programs for low-carbon alternative aviation fuels, which may include next-generation feedstocks, biofuels, and bioderived chemicals.

(b) COLLABORATION.—The Administrator shall collaborate with Federal agencies, industry stakeholders, research institutions, and other relevant stakeholders, to accelerate the research, development, testing, evaluation, and demonstrations programs described in subsection (a) and facilitate United States sustainability and competitiveness in aviation.

SEC. 220. LIMITATION.

None of the funds authorized in this Act may be used to conduct research, develop, design, plan, promulgate, implement, or execute a policy, program, order, or contract of any kind with the Chinese Communist Party or any Chinese-owned entity unless such activities are specifically authorized by a law enacted after the date of enactment of this Act.

PURPOSE AND SUMMARY

H.R. 3559, the Federal Aviation Administration Research and Development Act of 2023, improves American aviation by directing Federal Aviation Administration (FAA) research and development activities that will inform efforts to make aviation safer, more efficient, and more reliable.

BACKGROUND AND NEED FOR LEGISLATION

Research and development efforts set forth in this legislation support and enhance various aspects of the aviation industry. The bill recognizes the foundational importance of runways and ground safety, and directs research to ensuring pavement durability and address hazards which arise during surface operations at airfields. It drives innovation in aerospace vehicle construction, by carrying out research on advanced manufacturing, such as additive manufacturing. It also promotes research into cleaner aviation fuels like hydrogen and alternatives to leaded gasoline, thereby contributing to environmental sustainability.

The legislation also prioritizes research to improve air traffic control system, with a specific focus on monitoring traffic over oceans and remote areas. This ensures that aviation operations are safer and more efficient, benefiting both passengers and the industry as a whole. Furthermore, by addressing weather forecasting, the legislation emphasizes the importance of accurate aviation weather detection and prediction. This can significantly reduce delays and increase safety by providing more reliable information for flight planning and operations.

Importantly, the legislation ensures that safety remains a primary focus in FAA's research and development activities. By mandating a report on the allocation of at least 70% of R&D funds towards improving safety, it holds the FAA accountable and maintains a strong commitment to enhancing safety measures within the aviation industry. By addressing these crucial areas, the legislation promotes the overall advancement, efficiency, and safety of the aviation industry.

LEGISLATIVE HISTORY

H.R. 3559 was introduced on May 22, 2023, by Representative Frank D. Lucas (R–OK).

On June 15, 2023, the Committee on Science, Space, and Technology met to consider H.R. 3559. Chairman Lucas moved that Committee favorably report the bill, H.R. 3559, as amended, to the House of Representatives with the recommendation that the bill be approved. The motion was agreed to by a vote of 29–0.

SECTION-BY-SECTION

Section 1. Short title; Table of Contents

This section establishes a table of contents for the bill and establishes the short title of the bill as the "FAA Research and Development Act of 2023."

Section 2. Definitions

This section provides the meaning of terms used throughout the legislative text.

Section 3. Authorization of appropriations

This section lists the funds authorized to be appropriated to the FAA to carry out research and development activities for fiscal years 2024–2028.

TITLE I—FAA RESEARCH AND DEVELOPMENT ORGANIZATION

Section 101. Report on implementation; funding for safety research and development

This section directs the Comptroller General of the United States to submit a report to Congress to determine whether at least 70 percent of appropriated amounts supports safety research and development projects.

TITLE II—FAA RESEARCH AND DEVELOPMENT ACTIVITIES

Section 201. Aviation fuel research, development, and usage

This section authorizes the Administrator of the FAA, in coordination with other federal agencies and the private sector, to create a roadmap on research and development related to safe, lead-free fuel. This roadmap must identify activities to accelerate the development, testing and certification of such fuel for general aviation aircraft, and consider feasibility of widespread use of lead-free fuel by 2028.

Section 202. Continuous Lower Energy, Emission, and Noise (CLEEN)

This section authorizes the Administrator to expand the Continuous, Lower Energy, Emission, and Noise (CLEEN) program and broaden eligibility to allow new entrants to the aviation system.

Section 203. Strategy on hydrogen aviation fuel research and development

This section directs the FAA Administrator to develop a research and development strategy on the safe use of hydrogen fuel as part of a sustainable future for aviation. This strategy will consider the feasibility, opportunities, and challenges associated with use of hydrogen in aviation. It also assesses the use of hydrogen in addition to other alternative approaches to traditional aviation fuel.

Section 204. Report on future electric grid resiliency

This section directs the Administrator, in coordination with the Secretary of Energy, to submit a report to Congress on the potential impacts on the electrical grid of increased use of advanced air mobility (AAM) vehicles and the potential impacts on clean energy generation from these activities.

Section 205. Air traffic surveillance and tracking over oceans and other remote locations

This section directs the Administrator, in consultation with the Administrator of NASA, to research civilian air traffic surveillance over the oceans and establish a pilot program to test and evaluate air traffic surveillance and tracking equipment over the U.S.-controlled oceanic airspace and other remote locations. The section also directs FAA to transmit a report to Congress on the activities conducted under this section.

Section 206. Utilizing space-based assets to improve air traffic control and aviation safety

This section directs the Administrator, in coordination with the Administrator of NASA, to carry out a program for research and development of air traffic control and aviation safety technologies utilizing space-based platforms and space-based automatic dependent surveillance-broadcast data. This program shall focus on monitoring and reporting air turbulence events, space-based multilliterate surveillance, and identifying global positioning system and global navigation satellite system interference on air traffic services.

Section 207. Aviation weather technology review

This section directs the Administrator, in consultation with the NOAA Administrator, to conduct a review of current and planned technologies that can more accurately detect and predict weather impacts to aviation, inform how advanced predictive models can enhance aviation operations, and increase national airspace system safety and efficiency.

Section 208. Air traffic surface operations safety

This section directs the Administrator to research technologies and operations that enhance air traffic surface operations safety, identify ground-hazards, reduce near-misses at airports, and enhance situational awareness of pilots and controllers, and to also consider data from diverse advanced air mobility operations to inform current safety programs.

Section 209. Airport and airfield pavement technology research program

This section authorizes the Administrator to continue the competitive grant program to support Airfield Payment Technology Program, which deploys innovative technologies for airfield pavements, taxiways, and aprons for safer, more cost-effective, and more durable airfield pavements.

Section 210. Technology review of artificial intelligence and machine learning technologies

This section directs the Administrator to conduct a review of current and planned artificial intelligence and machine learning technologies that may be used to improve airport safety and efficiency, and report to Congress on the results.

Section 211. Research plan for commercial supersonic research

This section directs the Administrator, in consultation with the Administrator of NASA and industry, to identify additional research needed to support establishment of Federal and international policies, regulations, standards, and recommended practices relating to the certification and operation of civil supersonic aircraft.

Section 212. Electromagnetic spectrum research and development

This section directs the Administrator to conduct research and development related to the use and management of radio frequency spectrum in the civil aviation domain, including for aircraft, unmanned aircraft system, and advanced air mobility. The research will include impact to civil aviation safety when reallocating radio frequency spectrum adjacent to spectrum allocated for aviation communication, navigation, and surveillance, along with mitigation and implication of new emerging technologies on spectrum interference.

Section 213. Aviation structures, materials, and advanced manufacturing research and development

This section directs the Administrator to carry out a program for research and development of advanced additive manufacturing to assess safety of processes, aviation structures, and materials for use in and on aircraft in partnership with commercial entities. This section also directs FAA to report on the findings of this research to Congress.

Section. 214. Research plan on the remote tower program

This section directs the Administrator to submit a plan for additional research and development needed to mature remote tower technology and to provide a strategic roadmap for research needed to inform operational certification of remote towers in the National Airspace System (NAS).

Section 215. Air Traffic control training

This section directs the FAA Administrator to carry out a research program on the use of advanced technologies to reduce Certified Professional Controller training time to certification while maintaining or improving current levels of safety to enable increased staffing and pipeline of air traffic control workforce.

Section 216. Report on aviation cybersecurity directives

This section directs the Administrator to provide a report to Congress on the status of the FAA's implementation of the directive outlined in section 2111 of the FAA Extension, Safety, and Security Act. The report should include an assessment of FAA's progress in developing and implementing strategic cybersecurity framework,

and a description of prioritized research and development activities for the most needed improvements to safeguard the NAS.

Section 217. Rule of construction regarding collaborations

This section clarifies that the legislation does not modify or restrict collaborations between the Administrator, stakeholders, and labor organizations related to FAA research, development, demonstration, and testing activities.

Section 218. Turbulence research and development

This section directs the Administrator in coordination with the Administrator of NASA and the Administrator of the National Oceanic and Atmospheric Administration to conduct applied research and development on turbulence and its impact on aviation. The section also directs the Administrator to avoid duplication with existing research and development activities across the federal government and authorizes the purchase of data from commercial providers.

Section 219. Research, development and demonstration programs

This section directs the Administrator to carry out research, development, testing, evaluation, and demonstration of low-carbon fuels. This work is to be carried out in collaboration with federal agencies, industry stakeholders, research institutions, and other partners.

Section 220. Limitation

This section states that none of the funds made available under this act may be used for collaboration with the Chinese Community Party or any other Chinese-owned entity unless otherwise authorized by law after the date of enactment of the bill.

RELATED COMMITTEE HEARINGS

Pursuant to clause 3(c)(6) of rule XIII, the following hearing was used to develop or consider H.R. 3559:

On March 9, 2023, Chairman Frank Lucas presiding, the House Committee on Science, Space and Technology held a hearing titled, "The Federal Aviation Administration's Flight Plan: Examining the Agency's Research and Development Programs and Future Plans." The Committee received testimony regarding the FAA's portfolio of research and development programs and allowed members to examine various priorities and challenges ahead of reauthorizing these activities.

Witnesses:

- Ms. Shelley Yak, Director, FAA William J. Hughes Technical Center
- Dr. R. John Hansman, Director, International Center for Air Transportation, Massachusetts Institute of Technology
- Mr. Eric Cunningham, Vice President, Electric Power Systems, Collins Aerospace

COMMITTEE CONSIDERATION

On June 15, 2023, the Committee met in open session and ordered reported favorably the bill, H.R. 3559, as amended, by a recorded vote of 29 yeas to 0 nays, a quorum being present.

ROLL CALL VOTES

Clause 3(b) of rule XIII requires the Committee to list the record votes on the motion to report legislation and amendments thereto. The following reflects the record votes taken during the Committee consideration:

House Committee on Science, Space, and Technology
118th Congress
Full Committee Markup

Bill # H.R. 3559
Motion to report H.R. 3559, as amended, to the House

Majority	Aye	No	Present
Frank Lucas, Oklahoma	1		
Bill Posey, Florida	1		
Randy Weber, Texas			
Brian Babin, Texas	1		
Jim Baird, Indiana	1		
Daniel Webster, Florida	1		
Mike Garcia, California			
Stephanie Bice, Oklahoma			
Jay Obernolte, California	1		
Chuck Fleischmann, Tennessee			
Darrell Issa, California			
Rick Crawford, Arkansas	1		
Claudia Tenney, New York	1		
Ryan Zinke, Montana			
Scott Franklin, Florida			
Dale Strong, Alabama	1		
Max Miller, Ohio	1		
Rich McCormick, Georgia			
Mike Collins, Georgia	1		
Brandon Williams, New York	1		
Tom Kean, New Jersey	1		
Minority	**Aye**	**No**	**Present**
Zoe Lofgren, California	1		
Suzanne Bonamici, Oregon	1		
Haley Stevens, Michigan	1		
Jamaal Bowman, New York	1		
Deborah Ross, New Carolina			
Eric Sorensen, Illinois	1		
Andrea Salinas, Oregon	1		
Val Foushee, North Carolina	1		
Kevin Mullin, California	1		
Jeff Jackson, North Carolina			
Emilia Sykes, Ohio	1		
Maxwell Frost, Florida	1		
Yadira Caraveo, Colorado	1		
Summer Lee, Pennsylvania	1		
Jennifer McClellan, Virgina	1		
Ted Lieu, California	1		
Sean Casten, Illinois	1		
Paul Tonko	1		
Total	29	0	

Date: 6/15/23

Offered By: Chairman Frank Lucas of Oaklahoma

Result?	Agreed To: [X] Not Agreed To: [ ] Withdrawn: [ ]		
Voice Vote	*Ayes*	*Nays*	*Present*
	29	*0*	

APPLICATION OF LAW TO THE LEGISLATIVE BRANCH

The Committee finds that H.R. 3559 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

STATEMENT OF OVERSIGHT FINDINGS AND RECOMMENDATIONS OF THE COMMITTEE

In compliance with clause 3(c)(1) of rule XIII and clause (2)(b)(1) of rule X, the Committee's oversight findings and recommendations are reflected in the descriptive portions of this report.

STATEMENT OF GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause (3)(c)(4) of rule XIII, the goal of H.R. 3559 is to improve American aviation by directing Federal Aviation Administration (FAA) research and development activities that will inform efforts to make aviation safer, more efficient, and more reliable.

DUPLICATION OF FEDERAL PROGRAMS

Pursuant to clause 3(c)(5) of rule XIII, the Committee finds that no provision of H.R. 3559 establishes or reauthorizes a program of the Federal Government known to be duplicative of another Federal program, including any program that was included in a report to Congress pursuant to section 21 of Public Law 111–139 or identified in the most recent Catalog of Federal Domestic Assistance.

FEDERAL ADVISORY COMMITTEE ACT

The Committee finds that the legislation does not establish or authorize the establishment of an advisory committee within the definition of section 5(b) of the Federal Advisory Committee Act.

UNFUNDED MANDATE STATEMENT

The Committee adopts as its own the estimate of Federal mandates prepared by the Director of the Congressional Budget Office pursuant to section 423 of the Unfunded Mandates Reform Act.

EARMARK IDENTIFICATION

Pursuant to clauses 9(e), 9(f), and 9(g) of rule XXI, the Committee finds that H.R. 3559 does not include any congressional earmarks, limited tax benefits, or limited tariff benefits.

COMMITTEE COST ESTIMATE

Pursuant to clause 3(d)(1) of rule XIII, the Committee adopts as its own the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974. At the time this report was filed, the estimate was not yet available.

NEW BUDGET AUTHORITY, ENTITLEMENT AUTHORITY, AND TAX EXPENDITURES

Pursuant to clause 3(c)(2) of rule XIII, the Committee finds that H.R. 3559 would result in no new or increased budget authority, entitlement authority, or tax expenditures or revenues.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

Pursuant to clause 3(c)(3) of rule XIII, at the time this report was filed, the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974 was not yet available.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, and existing law in which no change is proposed is shown in roman):

TITLE 49, UNITED STATES CODE

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SUBTITLE VII—AVIATION PROGRAMS

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PART C—FINANCING

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CHAPTER 481—AIRPORT AND AIRWAY TRUST FUND AUTHORIZATIONS

* * * * * * *

§ 48102. Research and development

(a) AUTHORIZATION OF APPROPRIATIONS.—Not more than the following amounts may be appropriated to the Secretary of Transportation out of the Airport and Airway Trust Fund established under section 9502 of the Internal Revenue Code of 1986 (26 U.S.C. 9502) for conducting civil aviation research and development under sections 44504, 44505, 44507, 44509, and 44511–44513 of this title:

(1) for fiscal year 2004, $346,317,000, including—

(A) $65,000,000 for Improving Aviation Safety;

(B) $24,000,000 for Weather Safety Research;

(C) $27,500,000 for Human Factors and Aeromedical Research;

(D) $30,000,000 for Environmental Research and Development, of which $20,000,000 shall be for research activities related to reducing community exposure to civilian aircraft noise or emissions;

(E) $7,000,000 for Research Mission Support;

(F) $10,000,000 for the Airport Cooperative Research Program;

(G) $1,500,000 for carrying out subsection (h) of this section;

(H) $42,800,000 for Advanced Technology Development and Prototyping;

(I) $30,300,000 for Safe Flight 21;

(J) $90,800,000 for the Center for Advanced Aviation System Development;

(K) $9,667,000 for Airports Technology-Safety; and

(L) $7,750,000 for Airports Technology-Efficiency;

(2) for fiscal year 2005, $356,192,000, including—

(A) $65,705,000 for Improving Aviation Safety;

(B) $24,260,000 for Weather Safety Research;

(C) $27,800,000 for Human Factors and Aeromedical Research;

(D) $30,109,000 for Environmental Research and Development, of which $20,000,000 shall be for research activities related to reducing community exposure to civilian aircraft noise or emissions;

(E) $7,076,000 for Research Mission Support;

(F) $10,000,000 for the Airport Cooperative Research Program;

(G) $1,650,000 for carrying out subsection (h) of this section;

(H) $43,300,000 for Advanced Technology Development and Prototyping;

(I) $31,100,000 for Safe Flight 21;

(J) $95,400,000 for the Center for Advanced Aviation System Development;

(K) $2,200,000 for Free Flight Phase 2;

(L) $9,764,000 for Airports Technology-Safety; and

(M) $7,828,000 for Airports Technology-Efficiency;

(3) for fiscal year 2006, $352,157,000, including—

(A) $66,447,000 for Improving Aviation Safety;

(B) $24,534,000 for Weather Safety Research;

(C) $28,114,000 for Human Factors and Aeromedical Research;

(D) $30,223,000 for Environmental Research and Development, of which $20,000,000 shall be for research activities related to reducing community exposure to civilian aircraft noise or emissions;

(E) $7,156,000 for Research Mission Support;

(F) $10,000,000 for the Airport Cooperation Research Program;

(G) $1,815,000 for carrying out subsection (h) of this section;

(H) $42,200,000 for Advanced Technology Development and Prototyping;

(I) $23,900,000 for Safe Flight 21;

(J) $100,000,000 for the Center for Advanced Aviation System Development;

(K) $9,862,000 for Airports Technology-Safety; and

(L) $7,906,000 for Airports Technology-Efficiency;

(4) for fiscal year 2007, $356,261,000, including—

(A) $67,244,000 for Improving Aviation Safety;
(B) $24,828,000 for Weather Safety Research;
(C) $28,451,000 for Human Factors and Aeromedical Research;
(D) $30,586,000 for Environmental Research and Development, of which $20,000,000 shall be for research activities related to reducing community exposure to civilian aircraft noise or emissions;
(E) $7,242,000 for Research Mission Support;
(F) $10,000,000 for the Airport Cooperation Research Program;
(G) $1,837,000 for carrying out subsection (h) of this section;
(H) $42,706,000 for Advanced Technology Development and Prototyping;
(I) $24,187,000 for Safe Flight 21;
(J) $101,200,000 for the Center for Advanced Aviation System Development;
(K) $9,980,000 for Airports Technology-Safety; and
(L) $8,000,000 for Airports Technology-Efficiency;
(5) $171,000,000 for fiscal year 2009;
(6) $190,500,000 for fiscal year 2010;
(7) $170,000,000 for fiscal year 2011;
(8) $168,000,000 for each of fiscal years 2012 through 2015;
(9) $166,000,000 for each of fiscal years 2016 and 2017;
(10) $189,000,000 for fiscal year 2018;
(11) $194,000,000 for fiscal year 2019;
(12) $199,000,000 for fiscal year 2020;
(13) $204,000,000 for fiscal year 2021;
(14) $209,000,000 for fiscal year 2022; [and]
(15) $214,000,000 for fiscal year 2023[.];
(16) $255,130,000; for fiscal year 2024;
(17) $261,000,000 for fiscal year 2025;
(18) $267,000,000 for fiscal year 2026;
(19) $273,000,000 for fiscal year 2027; and
(20) $279,000,000 for fiscal year 2028.

(b) RESEARCH PRIORITIES.—(1) The Administrator shall prioritize safety in considering the advice and recommendations of the research advisory committee established by section 44508 of this title in establishing priorities among major categories of research and development activities carried out by the Federal Aviation Administration.

(2) As safety related activities shall be the highest research priority, at least 70 percent of the amount appropriated under subsection (a) of this section shall be for safety research and development projects.

(3) At least 15 percent of the amount appropriated under subsection (a) of this section shall be for long-term research projects.

(c) TRANSFERS BETWEEN CATEGORIES.—(1) Not more than 10 percent of the net amount authorized for a category of projects and activities in a fiscal year under subsection (a) of this section may be transferred to or from that category in that fiscal year.

(2) The Secretary may transfer more than 10 percent of an authorized amount to or from a category only after—

(A) submitting a written explanation of the proposed transfer to the Committees on Science and Appropriations of the House of Representatives and the Committees on Commerce, Science, and Transportation and Appropriations of the Senate; and

(B) 30 days have passed after the explanation is submitted or each Committee notifies the Secretary in writing that it does not object to the proposed transfer.

(d) AIRPORT CAPACITY RESEARCH AND DEVELOPMENT.—(1) Of the amounts made available under subsection (a) of this section, at least $25,000,000 may be appropriated each fiscal year for research and development under section 44505(a) and (c) of this title on preserving and enhancing airport capacity, including research and development on improvements to airport design standards, maintenance, safety, operations, and environmental concerns.

(2) The Administrator shall submit to the Committees on Science and Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report on expenditures made under paragraph (1) of this subsection for each fiscal year. The report shall be submitted not later than 60 days after the end of the fiscal year.

(e) AIR TRAFFIC CONTROLLER PERFORMANCE RESEARCH.—Necessary amounts may be appropriated to the Secretary out of amounts in the Fund available for research and development to conduct research under section 44506(a) and (b) of this title.

(f) AVAILABILITY OF AMOUNTS.—Amounts appropriated under subsection (a) of this section remain available until expended.

(g) ANNUAL SUBMISSION OF THE NATIONAL AVIATION RESEARCH PLAN.—The Administrator shall submit the national aviation research plan to Congress no later than the date of submission of the President's budget request to Congress for that fiscal year, as required under section 44501(c).

(h) RESEARCH GRANTS PROGRAM INVOLVING UNDERGRADUATE STUDENTS.—

(1) ESTABLISHMENT.—The Administrator of the Federal Aviation Administration shall establish a program to utilize undergraduate and technical colleges, including Historically Black Colleges and Universities and Hispanic Serving Institutions, in research on subjects of relevance to the Federal Aviation Administration. Grants may be awarded under this subsection for—

(A) research projects to be carried out at primarily undergraduate institutions and technical colleges;

(B) research projects that combine research at primarily undergraduate institutions and technical colleges with other research supported by the Federal Aviation Administration;

(C) research on future training requirements on projected changes in regulatory requirements for aircraft maintenance and power plant licensees; or

(D) research on the impact of new technologies and procedures, particularly those related to aircraft flight deck and air traffic management functions, on training requirements for pilots and air traffic controllers.

(2) NOTICE OF CRITERIA.—Within 6 months after the date of the enactment of the FAA Research, Engineering, and Develop-

ment Authorization Act of 1998, the Administrator of the Federal Aviation Administration shall establish and publish in the Federal Register criteria for the submittal of proposals for a grant under this subsection, and for the awarding of such grants.

(3) PRINCIPAL CRITERIA.—The principal criteria for the awarding of grants under this subsection shall be—

(A) the relevance of the proposed research to technical research needs identified by the Federal Aviation Administration;

(B) the scientific and technical merit of the proposed research; and

(C) the potential for participation by undergraduate students in the proposed research.

(4) COMPETITIVE, MERIT-BASED EVALUATION.—Grants shall be awarded under this subsection on the basis of evaluation of proposals through a competitive, merit-based process.

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FAA REAUTHORIZATION ACT OF 2018

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DIVISION B—FAA REAUTHORIZATION ACT OF 2018

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TITLE VII—FLIGHT R&D ACT

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Subtitle E—FAA Research and Development Activities

* * * * * * *

SEC. 744. RESEARCH AND DEPLOYMENT OF CERTAIN AIRFIELD PAVEMENT TECHNOLOGIES.

Using amounts made available under section 48102(a) of title 49, United States Code, the Administrator of the Federal Aviation Administration may carry out a program for the research and development of aircraft pavement technologies under which the Administrator makes grants to, and enters into cooperative agreements with, institutions of higher education and nonprofit organizations that—

(1) research concrete and asphalt airfield pavement technologies that extend the life of airfield pavements;

(2) develop and conduct training;

(3) provide for demonstration projects; [and]

(4) promote the latest airfield pavement technologies to aid in the development of safer, more cost effective, and more [du-

rable airfield pavements.] *resilient and sustainable airfield and vertiport pavements; and*

(5) develop sustainability and resiliency guidelines to improve long-term pavement performance and reduce carbon emissions.

* * * * * * *

COMMITTEE CORRESPONDENCE

Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington, DC 20515

Sam Graves
Chairman

Jack Ruddy, Staff Director

Rick Larsen
Ranking Member

Katherine W. Dedrick, Democratic Staff Director

July 7, 2023

The Honorable Frank D. Lucas
Chairman
Committee on Science, Space, and Technology
United States House of Representatives
2321 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Lucas:

I write to you concerning H.R. 3559, the *FAA Research and Development Act of 2023*. The bill was referred primarily to the Committee on Science, Space, and Technology, with an additional referral to the Committee on Transportation and Infrastructure. Specifically, provisions of H.R. 3559 fall within the Rule X jurisdiction of the Committee on Transportation and Infrastructure.

I recognize and appreciate your desire to bring this legislation before the House of Representatives in an expeditious manner, and accordingly, the Committee on Transportation and Infrastructure will forgo action on the bill. However, this is conditional on our mutual understanding that doing so will not prejudice the Committee on Transportation and Infrastructure with respect to the appointment of conferees or to any future jurisdictional claim over the subject matter contained within the bill or similar legislation that falls under the Committee on Transportation and Infrastructure's Rule X jurisdiction. Further, should a conference on the bill be necessary, I appreciate your agreement to support my request to have the Committee represented on the conference committee.

Finally, I would ask that a copy of this letter and your response acknowledging our jurisdictional interest in the bill be included in the Committee Report and *Congressional Record* during consideration of H.R. 3559 on the House floor.

Sincerely,

Sam Graves
Chairman
Committee on Transportation
and Infrastructure

cc: The Honorable Kevin McCarthy, Speaker
The Honorable Rick Larsen, Ranking Member, Committee on Transportation and Infrastructure
The Honorable Zoe Lofgren, Ranking Member, Committee on Science, Space, and Technology
Mr. Jason Smith, Parliamentarian

FRANK D. LUCAS, Oklahoma
CHAIRMAN

ZOE LOFGREN, California
RANKING MEMBER

Congress of the United States
House of Representatives
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
2321 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515–6301
(202) 225–6371
www.science.house.gov

July 10, 2023

The Honorable Sam Graves
Chairman
Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Thank you for your letter regarding H.R. 3559, the "FAA Research and Development Act of 2023," which was referred initially to the Committee on Science, Space, and Technology and sequentially to the Committee on Transportation and Infrastructure.

I appreciate your willingness to work cooperatively on this bill. I recognize that the Committee on Transportation and Infrastructure has a valid jurisdictional interest in certain provisions of H.R. 3559, and that the Committee's jurisdiction should not be adversely affected by your decision to forego formal consideration of H.R. 3559. As you have requested, I will support your request for an appropriate appointment of outside conferees from your committee in the event of a House-Senate conference on this or similar legislation should such a conference be convened.

Finally, I will include a copy of your letter and this response in the Committee Report and in the *Congressional Record* during the floor consideration of this bill. Thank you again for your cooperation.

Sincerely,

Frank D. Lucas
Chairman

cc: The Honorable Kevin McCarthy
The Honorable Rick Larsen
The Honorable Zoe Lofgren
Mr. Jason Smith, Parliamentarian

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