



U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., SW.
Washington, DC 20591

April 27, 2020

The Honorable Roger Wicker
Chairman, Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

This letter encloses the Federal Aviation Administration's (FAA) report to Congress on the progress in meeting the requirements of Section 181(d) of the 2018 FAA Reauthorization (P.L.115-254).

Section 181(d) of the 2018 FAA Reauthorization directed the FAA to submit to the appropriate committees of Congress a report detailing:

- (1) the Administrator's actions to exercise leadership in the creation of Federal and international policies, regulations, and standards relating to the certification and safe and efficient operation of civil supersonic aircraft;
- (2) planned, proposed, and anticipated actions to update or modify existing policies and regulations related to civil supersonic aircraft, including those identified as a result of industry consultation and feedback; and
- (3) a timeline for any actions to be taken to update or modify existing policies and regulations related to civil supersonic aircraft.

We look forward to continued collaboration with your staff and would be happy to schedule time to brief you further if desired.

We have sent identical letters to Chairman DeFazio, Senator Cantwell, and Congressman Graves.

Sincerely,

A handwritten signature in black ink that reads "Steve Dickson". The signature is fluid and cursive, with the first letters of "Steve" and "Dickson" being capitalized and prominent.

Steve Dickson
Administrator

Enclosure



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April 27, 2020

The Honorable Peter A. DeFazio
Chairman, Committee on Transportation
and Infrastructure
House of Representatives
Washington, DC 20515

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The Honorable Maria Cantwell
Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Senator Cantwell:

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April 27, 2020

The Honorable Sam Graves
Committee on Transportation and Infrastructure
House of Representatives
Washington, DC 20515

Dear Congressman Graves:

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Executive Summary

In Section 181 of the FAA Reauthorization Act of 2018 (Pub. L. No. 115-254) (Act), Congress tasked the FAA with showing leadership regarding the reintroduction of supersonic aircraft (i.e. aircraft capable of sustained flight above Mach 1.0). Section 181 included some specific actions and required the preparation of a report on specific activities related to supersonic aircraft within a year after enactment of the Act. This report describes the activities undertaken by FAA to meet the provisions of Section 181.

The United States is taking action to advance the deployment of supersonic aircraft both domestically and internationally, to develop the necessary standards to enable supersonic flight, and to address concerns such as noise. Over the last few years, multiple United States manufacturers announced the intent to design and build aircraft capable of supersonic flight. The Department of Transportation, through the FAA, has been pursuing this goal through the development of necessary policies, regulations and standards for the safe and efficient operation of the aircraft.

Given that aviation is an international industry, it is imperative that any standards are internationally recognized. The United States develops international standards and recommended practices through the International Civil Aviation Organization (ICAO). Specifically, environmental standards and recommended practices are developed through ICAO's Committee on Aviation Environmental Protection (CAEP). Through ICAO CAEP and other venues, the FAA is a leader in the pursuit of international standards for aircraft capable of sustained supersonic flight.

In June 2019, the Department of Transportation issued a notice of proposed rulemaking (NPRM) to streamline and clarify the procedures for obtaining FAA approval to conduct supersonic flight testing in the United States. The action was a concrete step that demonstrated the United States' commitment to innovation and supporting the development of new civil supersonic aircraft by the aerospace sector. The rule, as proposed, will help ensure that companies developing these aircraft have a clearer understanding of the process for gaining approval to conduct flight testing, a key step in ultimately bringing their products to market. The publication of this rule was a requirement of Section 181(e)(2) of the FAA Reauthorization Act of 2018.

In March 2020, the Department of Transportation issued a second NPRM focused on landing and takeoff noise certification standards for certain new supersonic aircraft. With a number of supersonic aircraft projects currently under development in the United States, this action will help ensure that companies developing these aircraft have clarity regarding the FAA certification process for these vehicles. The publication of the NPRM

is an important milestone on the path toward the potential re-introduction of civil supersonic travel for the American flying public and will be open to public comment until mid-July 2020.

Introduction

Prior to the FAA Reauthorization of 2018, multiple aircraft manufacturers had expressed interest in the development of civil aircraft capable of flying at sustained speeds in excess of Mach 1.0. These manufacturers projected the mid-2020s as the timeframe for entering these new supersonic aircraft into service. At the same time, the National Aeronautics and Space Administration (NASA) has continued to invest in future supersonic technology, including plans to design and build an X-plane (X-59) demonstrating the advanced technology to limit sonic boom noise when flying over Mach 1.0.

Current U.S. noise certification standards are not applicable to new supersonic aircraft. The FAA is focusing its work on developing the necessary standards for civil supersonic aircraft and published a notice of proposed rulemaking on landing and takeoff noise certification standards on March 30, 2020. FAA has done this not only through the development of domestic regulations, but also through leading the development of international standards for civil supersonic aircraft.

Beyond certification, U.S. regulations prohibit flight operations in excess of Mach 1 over land in the United States except in compliance with conditions and limitations in an authorization to Exceed Mach 1 issued to the operator under appendix B of 49 U.S.C. Part 91. 14 CFR § 91.817. As an additional protection, aircraft flying to or from the United States are prohibited from creating a sonic boom that could reach the U.S. shoreline unless the operator complies with conditions and limitations in an authorization to exceed Mach 1 issued under appendix B of 49 U.S.C. Part 91. 14 CFR § 91.817(b). These exemptions are meant to allow for the necessary testing of aircraft operating over Mach 1 and are not designed to allow for continued operation of supersonic flight over land. With technological advances that may be able to alter¹ and/or abate² the sound associated with a sonic boom, there is a possibility to introduce supersonic flight over the United States, though additional research is needed prior to FAA determining whether the current operating restrictions should be reconsidered.

The FAA recognized years ago that development of new supersonic aircraft means that such aircraft would need to be tested at speeds greater than Mach 1.0. Therefore, since 1973, regulations have been in place to request a special flight authorization to flight test aircraft at speeds in excess of Mach 1.0 (14 CFR Part 91.817). The FAA published an NPRM in June 2019 to streamline and clarify the application procedure in recognition of the increased interest in supersonic aircraft development.

The FAA Reauthorization Act of 2018 was enacted during the period when FAA was increasing its efforts to examine what is needed to reintroduce supersonic aircraft,. The direction in

¹ Accomplished by shaping altering the N-wave associated with a sonic boom (https://www.nasa.gov/centers/dryden/multimedia/imagegallery/SSBD/SSBD_proj_desc.html)

² May be accomplished through a phenomenon named “Mach cut-off” where the sound wave is reflected back into the atmosphere prior to reaching the ground (<https://ascent.aero/project/acoustical-model-of-mach-cut-off/>)

Section 181 of the Act has reinforced the priority to develop the necessary standards, both domestically and internationally. This report satisfies Section 181 (d) of the FAA Reauthorization Act of 2018.

FAA Status on Section 181 activities:

The Administrator's Leadership

Engaging Supersonic Stakeholders

In March 2018, the FAA initiated consultations with supersonic aircraft and engine manufacturers, seeking information consistent with the provision. To-date, the FAA continues to seek technical input from the aerospace industry regarding civil supersonic aircraft. FAA conducted multiple meetings with potential manufacturers of civil supersonic aircraft to support the on-going rulemaking regarding noise certification standards. In addition, FAA solicited information from some aerospace manufacturers regarding civil supersonic aircraft to better understand the possible aircraft weights and design Mach speeds of potential supersonic aircraft that may enter the market.

The Department of Transportation has used public events and conferences as opportunities to share its ideas regarding supersonic aircraft with a broad range of stakeholders. For example, the FAA has discussed the provision in reauthorization at advisory committee meetings, airport roundtables, and at conferences at which airport operators, airlines, and the public are present.

The FAA continues to work with all stakeholders to understand the operational differences between subsonic aircraft and supersonic aircraft. The FAA has also had discussion regarding technology limitations for supersonic aircraft compared to subsonic aircraft and the associated costs and benefits. Information gathered by the stakeholders will inform future noise rulemaking for supersonic aircraft and result in a proposed regulation that is economically reasonable, technologically practicable and appropriate for civil supersonic aircraft. In addition, the Department of Transportation, including FAA, has emphasized the United States priority to advance the development of supersonic aircraft in the context of international engagements.

Beyond the work with manufacturers, NASA is an important partner to FAA with respect to the development of supersonic regulations. NASA has dedicated resources to help develop conceptual supersonic airplanes to better understand potential noise certification levels of the aircraft. In addition, NASA is in the process of fabricating the X-59 low boom, flight demonstrator aircraft to perform testing and establish human response data on low noise sonic boom exposure, which is one element of the information FAA will use when reconsidering the flight restrictions over the United States.

International Leadership

The FAA maintains multiple leadership roles in the ICAO CAEP working groups, including ones that address aircraft noise. These leadership roles have been leveraged to raise the profile of supersonic aircraft at ICAO CAEP. Within ICAO CAEP, work is underway in the areas of landing

and takeoff noise and emissions and en route, low noise sonic boom standards. In February 2019, the FAA secured an agreement with over twenty countries on the ICAO CAEP to conduct an ambitious study of new supersonic designs during the next three years that will help pave the way towards appropriate certification standards.

[Actions to Update or Modify Existing Policies and Regulations Related to Civil Supersonic Aircraft](#)

The Department of Transportation/FAA is currently conducting two rulemakings associated with supersonic aircraft.

[Special Flight Authorization Rulemaking](#)

The first rulemaking, required under Section 181(e)(2) of the Act, was published in June 2019 as an NPRM to streamline and clarify the procedures for obtaining FAA approval to conduct supersonic flight testing in the United States. This action was a concrete step that demonstrates the United States' commitment to innovation and to support the development of new civil supersonic aircraft by the aerospace sector. The NPRM will help ensure that companies developing these aircraft have clarity regarding the process for gaining approval to conduct flight testing, as a key step in ultimately bringing their products to market. This publication of this rule was a requirement of Section 181 of the FAA Reauthorization Act of 2018 and was published ahead of the mandated deadline, which is December 31, 2019 statutory deadline. Following a careful review of the comments submitted, the FAA anticipates moving forward with the final rule in a similar expedited manner.

[Noise Certification Rulemaking](#)

The second rulemaking, required under Section 181(e)(1) of the Act, will propose new landing and takeoff (LTO) noise certification standards for supersonic aircraft. This rule will update 14 CFR Part 36 to include supersonic airplanes in its applicability. The FAA published an NPRM in March 2020³. The FAA anticipates having a final rule in place in early 2022 that would allow certification for subsonic operation of these new airplanes.

[Long Term Endeavors](#)

Beyond these two current rulemakings, the FAA continues to develop information relevant to reviewing available aircraft noise and performance data to determine whether 14 CFR 91.817 and Appendix B of part 91 may be amended (per section (f)(5) of Section 181). The FAA will continue to work closely with NASA and eagerly awaits the results of the NASA X-59 and other research initiatives.

³ FAA published the NPRM on its website on March 30, 2020. The NPRM was published in the Federal Register on April 13, 2020.