



**Human Factors
and Ergonomics
Society**

**Official Written Testimony in Support of
Fiscal Year 2022 Science and Research Funding at the Department of Transportation**

Submitted to the Senate Subcommittee on Transportation, Housing and Urban Development, and
Related Agencies; Committee on Appropriations
United States Senate
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On behalf of the Human Factors and Ergonomics Society (HFES), we are pleased to provide this written testimony to the Senate Appropriations Subcommittee on Transportation, Housing and Urban Development, and Related Agencies for the official record. **HFES urges the Subcommittee to provide robust funding for the Federal Aviation Administration (FAA), specifically the Research, Engineering and Development (RE/D), in the fiscal year (FY) 2023 appropriations process.** Additionally, as the FAA continues work to implement provisions from the *Aircraft Certification, safety, and Accountability Act*, **HFES supports robust funding to implement and oversee significant expansion of the degree to which FAA prioritizes and promotes a strong safety culture that includes human factors concerns both internally and at all levels of aircraft manufacturers.**

HFES also supports robust funding for the Department of Transportation (DOT) to accelerate the development and deployment of safer, more efficient transportation technologies.

HFES and its members recognize and appreciate the challenging fiscal environment in which we as a nation currently find ourselves. However, we believe strongly that investment in scientific research serves as an important driver for innovation and the economy and for maintaining American global competitiveness. We thank the Subcommittee for its longtime recognition of the value of scientific and engineering research and its contribution to innovation in the U.S.

The Value of Human Factors and Ergonomics Science

HFES is a multidisciplinary professional association with over 4,500 individual members worldwide, comprised of scientists and practitioners, all with a common interest in enhancing the performance, effectiveness, and safety of systems with which humans interact through the design of those systems' user interfaces to optimally fit humans' physical and cognitive capabilities.

For over 50 years, the U.S. federal government has funded scientists and engineers to explore and better understand the relationship between humans, technology, and the environment. Originally stemming from urgent needs to improve the performance of humans using complex systems such as aircraft during World War II, the field of human factors and ergonomics (HF/E) works to develop safe, effective, and practical human use of technology. HF/E does this by developing scientific approaches for understanding this complex interface, also known as “human-systems integration.” Today, HF/E is applied to fields as diverse as transportation, architecture, environmental design, consumer products, electronics and computers, energy systems, medical devices, manufacturing, office automation, organizational design and management, aging, farming, health, sports and recreation, oil field operations, mining, forensics, and education.

With increasing reliance by federal agencies and the private sector on technology-aided decision-making, HF/E is vital to effectively achieving our national objectives. While a large proportion of HF/E research exists at the intersection of science and practice—that is, HF/E is often viewed more at the “applied” end of the science continuum—the field also contributes to advancing “fundamental” scientific understanding of the interface between human decision-making, engineering, design, technology, and the world around us. The reach of HF/E is profound, touching nearly all aspects of human life from the health care sector, to the ways we travel, to the hand-held devices we use every day.

Federal Aviation Administration Research, Engineering and Development

HFES strongly believes that federal investment in FAA RE/D will have a direct and positive impact on the U.S. economy, national security, and the safety and well-being of Americans. With regard to safety, the RE/D program includes specific funding for human factors in air traffic control (ATC) and flight deck maintenance and systems integration, with additional allocations for NextGen Air, as part of the Economic Competitiveness initiative. Additionally, human factors should be an ongoing consideration as FAA invests in research on airline passenger safety including seat width and cabin environments.

Implementation and Oversight of the Aircraft Certification Reform and Accountability Act

The science and practice of Human Factors Engineering is well established, with roots going back to the earliest days of aviation. Aviation is highly dependent on the design and development of safe, effective flight decks for pilot control. Achieving this goal is highly dependent on the early incorporation of Human Factors in the analysis, design, testing and certification processes. HFES is a strong supporter of the *Aircraft Certification, Safety, and Accountability Act*, which significantly reforms the FAA’s safety and oversight policies, procedures, and requirements to better account for Human Factors issues. HFES recommends that Congress:

1. Fully fund *Sec. 124 the Human Factors Education Program*, which establishes a program that “addresses the effects of modern flight deck systems, including automated systems, on human performance...and the approaches for better integration of human factors in aircraft design and certification.” Additionally, ensure participation in the new education program will be required for appropriate employees within FAA’s Flight Standards and Aircraft Certifications services.

2. Provide at least \$7.5 million, consistent with *Sec. 126 Human Factors Research*, for expansion of FAA's Human Factors research program with a priority for establishing research goals that target the improvement of design engineering and certification practices, the increased reliance on automated systems, and tools to validate pilot recognition and response when confronted with failure indications, among others.
3. Provide adequate funding for *Sec. 127 FAA Center of Excellence for Automated Systems and Humans Factors in Aircraft* for the creation of a new FAA Center of Excellence focusing on automated systems and human factors that advances research, convenes and promotes collaboration among academia, reviews safety reporting to identify potential human factors issues, and expands awareness of – and mechanisms to address – human systems integration in all aspects of transport aircraft operations.

Autonomous Vehicles and Automated Driving Systems

Additionally, the Society supports robust investments in DOT for research on autonomous and intelligent transportation technologies. These technologies, if designed and developed with HF/E considerations in mind, have the potential to significantly decrease traffic fatalities and make the American transportation system safer and more efficient. Specifically, HFES supports funding for and the consideration of HF/E research in NHTSA's Autonomous Vehicles Pilot program and the Federal Highway Administration's (FHWA) Intelligent Transportation Systems program (ITS), which are invaluable to the safe deployment of next generation transportation technologies. It is vital that we continue to perform and expand research on automated vehicles not only to drive innovation but to support the development of informed regulation of these emerging technologies.

Conclusion

Given FAA's critical role in supporting fundamental research and development across transportation and engineering disciplines, HFES supports robust funding for the FAA, specifically RE/D and implementation of Human Factors related sections of the *Aircraft Certification, Safety, and Accountability Act*, in the FY 2023 appropriations process. HFES also supports robust funding for DOT to accelerate the development and deployment of safer, more efficient transportation technologies.

On behalf of HFES, we would like to thank you for the opportunity to provide this testimony. Please do not hesitate to contact us should you have any questions about HFES or HF/E research. HFES truly appreciates the Subcommittee's long history of support for scientific research and innovation.