

AERONAUTICS R&D

A KEY TO ECONOMIC PROSPERITY



Aeronautics – the science of flight – is part of the foundation of our nation’s economic prosperity and is critical to maintaining our national security and defense. Federal investments in aeronautics have dramatically improved aviation safety, made air travel affordable for most Americans, and significantly reduced the environmental impact of aviation through reduced community noise and emissions.

GLOBAL CHALLENGES

While civil aviation markets have grown, NASA’s aeronautics funding had declined significantly during the 2000s and the first half of the 2010s. Starting in fiscal year 2014, funding has steadily increased from \$566 million to \$784 million in fiscal year 2020. This increased funding is paying dividends. NASA is contributing substantively in areas that are helping the United States keep pace with near-peer nations who have invested heavily in aviation. Consistent federal investment in aeronautics research and development is essential to compete with international competitors, like China and the European Union – both of which have a clear objective of wresting aeronautics leadership, and the resulting business opportunities, from the United States.

AERONAUTICS INVESTMENTS

NASA is investing in the most critical concepts and technologies required to support continued global leadership in civil aviation, including:

- › Ultra-Efficient Commercial Air Vehicles – Technologies that enable the U.S. industry to cultivate new markets and to stay competitive in existing markets, e.g., fundamental research in areas such as advanced composite materials for strong, lightweight aircraft structures.
- › Commercial Supersonic Aircraft – Experimental aircraft, or X-planes, that will demonstrate quiet overland supersonic flight, enabling regulatory rulemaking.
- › Assured Autonomy for Aviation Transformation – Key technologies required to integrate UAS into the national air space, including the development and implementation of the safe, low-altitude-operations UAS Traffic Management (UTM) system, and making urban air mobility (air taxis) a reality.
- › Safe, Efficient Growth in Global Operations/In-Time System-Wide Safety Assurance – New air traffic management tools that integrate aircraft arrival, departure, and airport surface operations to reduce flight delays and increase air traffic capacity and safety.
- › Transition to Low-Carbon Propulsion – Emerging capabilities, such as electric and hybrid-electric propulsion systems, as well as renewable alternate aviation fuels.
- › Hypersonic Flight – Fundamental research and testing to enable vehicles traveling at speeds in excess of Mach 5, including spaceplanes and military applications.
- › Workforce Enhancements – Growing and nurturing of the world’s premier aeronautics workforce and upgrading and maintaining test facilities to keep pace with emerging technologies.

WHAT’S NEXT

NASA’s Strategic Implementation Plan sets forth the Aeronautics Research Mission Directorate’s vision for aeronautical research aimed at the next 25 years and beyond. It encompasses a broad range of technologies to meet future needs of the aviation community, the nation, and the world for safe, efficient, flexible, and environmentally sustainable air transportation. The commercial aviation market is projected to double by 2040, supersonic aircraft will evolve and potentially take to the skies overhead, and autonomous vehicles have the potential to rapidly change our methods of mobility and means of transport. The U.S. economy stands to gain significantly from these emerging aviation markets. Realizing these benefits and ensuring U.S. preeminence in this field will require continued congressional support of this NASA Strategic Implementation Plan, as well as increased funding for robust, long-term federal civil aeronautics research and technology initiatives.



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