



FactSheet

National Aeronautics and
Space Administration

Ames Research Center
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AIRSPACE SYSTEMS (AS)

Developing concepts and systems for the future of air
transportation



Today, as global dependence on air transportation increases, difficult and important challenges are emerging. NASA's Airspace Systems (AS) Program is applying its extensive expertise and experience in aviation research and development to meet the demands of an evolving air traffic management system. The goal of the AS Program is to enable, through technology development and transfer of the technology, major increases in the capacity and mobility of the air transportation system.

The Program's objectives are to improve throughput, predictability, flexibility, collaboration, efficiency, and access to the National Airspace System (NAS). The resultant benefit to the user will be reduced flight delays and doorstep-to-destination trip duration, enabling more people and goods to travel faster and farther, anywhere, anytime, with fewer delays. This will be accomplished by developing, demonstrating and transferring technologies in the following areas:

- By 2004 enabling a 35% increase in aviation system throughput in the terminal area and a 20% increase in aviation system throughput en route based on 1997 NAS capacities.

- By 2009 enabling a further increase capacity increase of 50% over 1997 levels.

- By 2005 key enabling capabilities for a small aircraft transportation system."

It has established a bold goal in global civil aviation for the year 2022: to triple aviation system capacity and cut doorstep-to destination travel time by half. The centerpiece for achieving this goal is the Airspace Systems Program.

Working in concert with the Federal Aviation Administration (FAA), other government agencies, and industry, the AS Program will achieve its objectives through four distinct project areas:

Visit our website at <http://www.as.nasa.gov>

The Advanced Air Transportation Technologies (AATT) Project

The Advanced Air Transportation Technologies (AATT) Project AATT focuses on improving transport aircraft operations at and between major airports in the National Airspace System (NAS). The project is dedicated to enhancing the existing aviation infrastructure by defining, exploring, and developing advanced air traffic management (ATM) system concepts and tools suitable for pre-production prototype development by the FAA and industry. These prototypes will lead to eventual full-scale development and deployment in the field.



AATT is responding to the demands placed upon our existing system by developing decision support tools to assist air traffic controllers, airline dispatchers, and pilots to improve gate-to-gate operations. New flight deck and ground-based concepts are also being explored to support Free Flight, thus providing increased freedom to aircraft operators. The adaptation and integration of these tools into the NAS will address some of our most difficult ATM concerns and challenges.

Virtual Airspace Modeling and Simulation (VAMS) Project



The VAMS Project is a multi-year airspace research and development effort initiated by NASA in 2002. The VAMS Project is the NASA

response to the projected lack of sufficient future capacity in the nation's air transportation system. Working in cooperation with the FAA, other government agencies, and industry, NASA is developing and exploring revolutionary changes in airspace operations to answer this challenge.

The NAS is a highly complex, integrated system of systems. The new vision for the air transportation system of the 21st century is still evolving. With that vision will come the need to refine and test new theories and processes. By creating a robust, high fidelity modeling and simulation capability, the VAMS Project will examine and evaluate advanced concepts for the future NAS. The product of these valuations will describe a technology vision and its requirements for the next era in aviation.

Small Aircraft Transportation System (SATS) Project

The NASA SATS Project offers a revolutionary approach to relieving congested interstate highways and busy hub-and-spoke airports. The SATS project is investigating concepts and technologies for an on-demand, point-to-point, and widely distributed transportation system. This new approach relies on advanced four- to ten-passenger aircraft using new operating capabilities. Such a system promises improved safety, efficiency, reliability, and affordability using small aircraft operating from the nation's 5,400 public-use-landing facilities. About 98% of the U.S. population lives within 20 miles of at least one of these airports.



The SATS five-year research plan will invest in four operating capabilities: (1) high-volume operations at airports without control towers or terminal radar facilities, (2) technologies enabling safe landings in almost all weather conditions, (3) integration of SATS aircraft into a higher capacity air traffic control system, and (4) improved single-pilot ability to function competently in evolving, complex airspace.

Human Measures and Performance (HMP) Project

The HMP Project focuses upon the interaction of human operators with the complex systems and procedures required for operations in the NAS. To safely achieve significant increases in capacity and mobility within the NAS, a new generation of highly automated, complex, air transportation system tools and technologies is required.

The HMP Project aims to ensure, through sound design principles and operational guidelines, that the new air transportation systems never contribute to human error or needlessly increase pilot or operator workload. The emphasis of this research is on collecting human factors and performance data that focus on the cognitive, perceptual, and physiological aspects of how people interact with displays and controls, process information, make decisions, and collaborate with one another.

