

The Future of Flight



The Next 100 Years

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The Crisis in U.S. Aviation Research and Technology

We are deeply concerned about the lack of a national commitment to sustain U.S. leadership in aviation research and technology. While public demand for aviation transportation services and the needs of national defense are expanding, federal funding for civil and military aviation research is declining. Since 1998, the combined NASA and DoD investment in aeronautics research and technology programs has been reduced by one-third. Advanced technologies are needed to assure public safety and on-time flight schedules. In particular, the tragic events of September 11th have markedly increased the need for significant increases in Federal R&T applied to aviation and airport safety and security, both short term and long term. Without continued investment in aviation R&T, our technological edge in meeting the challenges of a sustained war against global terrorism might diminish. The U.S. market share in aviation products and services, would also continue to decline, as will employment in the nation's aviation industry.

The NASA and DoD aeronautics R&T budgets have been cut dramatically over more than a decade, and tens of thousands of skilled workers have left the industry. U.S. graduates at the bachelor and master degree levels in aerospace engineering and related disciplines have dropped by 57 percent and 39 percent, respectively, since 1990. These facts, combined with the fact that the average age of those employed in the aerospace industry is in the mid-to-upper 40s and climbing, suggest a potentially catastrophic loss of one of the nation's most important sources of societal benefits.

NASA and DOD have taken the first steps toward clearly articulated visions for aviation research and technology. These visions must now be supported by a national aviation research and technology strategy that maintains and builds U.S. market share in aviation products and services, ensures our national security, provides a continuing supply of qualified people to meet the nation's future aviation workforce needs and creates an environment conducive to a healthy U.S. aviation industry.

While U.S. government support for aviation research has declined, foreign government funding is increasing. The European community and Asian countries recognize the value of the aviation industry and its quality jobs to their economies. National will, available capital, and investments in leading edge technology determine the winners in this global competition.

According to a 1999 National Research Council report, "Recent Trends in US. Aeronautics Research and Technology," the U.S. aviation and rotorcraft industries (Boeing, Pratt & Whitney, General Electric, General Dynamics, Lockheed Martin, Textron, and others) contribute approximately \$436 billion per year of total output to the U.S. economy. Of this amount, air transportation and aircraft manufacturing account for approximately \$339 billion, accounting for over half a million manufacturing and engineering jobs. NASA's budget should reflect this by striving for a strong national commitment to aeronautical research. If the American public expects the U.S. aviation industry to continue to be the largest positive contributor to U.S. balance of trade, then we must have the ability to develop the next generation of aircraft that will enable it to compete internationally.

The future of U.S. aviation, with respect to both global competition and societal benefits, depends on new technology and new concepts. Government research establishments have, in the past, conducted essential fundamental and applied research, which were high risk, high cost, and long term. The uncertainty and risk inherent in revolutionary concepts cannot be undertaken solely by the private sector. The future demands a clear statement of national policy, establishing U.S. leadership both in aircraft and rotorcraft technology development that assures national security and international leadership with additional societal benefits, such as:

- Advanced vehicle technologies for innovative applications;
- Increased safety;
- Efficient air traffic management systems to reduce delays;
- Reduced air transportation cost and travel time;
- Increased fuel efficiency; and
- More environmentally friendly aircraft.

Historically, the government's support of aeronautics and rotorcraft research and technology (in collaboration with industry and universities) has been indispensable for attracting highly talented people whose contributions have made possible the societal benefits that we have seen to date. If America fails to support aviation R&T, it may well fail to provide an essential nucleus of next generation professionals for the nation's aviation future, thus jeopardizing our nation's security and prosperity.

Recommended Actions:

- Adequate funding for NASA and DOD aviation R&T must be addressed, not only with respect to the FY 2003 budget, but also – and even more significantly – with respect to the preservation of U.S. capability and leadership in long term aeronautics research and technology, as required by law.
- As the FY 2002 budget now requires that aeronautical research and technology be specified as a separate line item (as recommended by the Coalition's September 2000 position paper), it is essential that the aeronautics R&T programs at key agencies (NASA, DOD and FAA) continue to be clearly identified, defined and adequately funded within this category.
- The establishment of a National Aviation R&T policy to plan and provide adequate resources that will ensure sustained U.S. world leadership in civil and military aviation.

As we approach the centennial of the Wright Brothers' first flight, it is more important than ever that America renew its national commitment to leadership in aviation. In order to do so, we must ensure the strength and stability of the nation's aviation infrastructure by formulating and committing to a national aviation research and technology policy that incorporates adequate federal funding for visionary long-term aviation research.

(Submitted to House Science Subcommittee on Space and Aeronautics for the record of the 7 March 2002 hearing on U.S. Civil Aeronautics Research and Development.)