

# NEXTOR

for Aviation Operations Research

## Research

### Background

The National Center of Excellence for Operations Research (NEXTOR) was established on June 26, 1996 as one of five Centers of Excellence created by the Federal Aviation Administration (FAA). NEXTOR is expected to enhance and promote aviation related research and technology in mission critical areas and allow the FAA to partner with the academic community and industry to advance aviation research and technology.

### Strategic Goals

To benefit the aviation community, NEXTOR focuses on three strategic goals.

- Research: Develop and maintain a stable core research program that distinguishes NEXTOR as a source of high-quality, value-added aviation research
- Education: Provide educational opportunities for students and professionals who are or have the capability to become the leaders in the aviation community
- Knowledge Transfer: Bring industry, academia, and government together to discuss critical issues in aviation operations and develop consensus on key industry developments

### Benefits for the Aviation Community

- Government increases access to forward looking aviation research from leading research universities
  - Universities increase their technical breadth and create greater academic opportunities for aviation
  - Industry benefits by participating in the development of rapid technological innovation
- System users gain insights to improve their operational efficiency and profitability

<http://www.nextor.org>

## Knowledge Transfer

### Research

NEXTOR works with the FAA and its industry partners to understand how the National Aerospace System (NAS) service providers and users will respond to alternative system architectures, operations environments, concepts, investment strategies, and finance mechanisms. The knowledge and capabilities gained from this research will assist decision makers in dealing with a host of issues, from near-term investment choices to long-term strategies for system renewal. The research focus includes:

1. Safety. Develop systems, analysis methods, and improve databases to assess past performance and identify opportunities for improvement of safety-critical equipment and procedures.
2. Air Traffic Control. Address modernization of procedures and equipment to improve NAS system performance and enable the system to accommodate future growth.
3. System Performance and Assessment Measures. Enhance the abilities of the FAA to evaluate, document, and improve NAS performance.
4. Flow Control. Address the integration of operations-related factors in the design of advanced air traffic management.
5. Operations Research and Simulation Tools. Develop modeling and problem solving techniques to address aviation issues.
6. Navigation, Communication and Data Transfer. Design and analyze next generation navigation, communication, and data transfer systems
7. Human-in-the-Loop System. Investigate information systems and decision aids for advanced systems that are simultaneously driven by technical considerations and human capabilities.
8. Software Certification and Reliability. Develop protocols to ensure safety-critical software performs reliably and predictably.



## Education

Over 100 graduate students have participated in NEXTOR research programs since the organization's formation in 1996. UC Berkeley, Virginia



Tech, Massachusetts Institute of Technology, University of Maryland, and George Mason University also work with many university partners to provide students with numerous opportunities for research and higher education.

NEXTOR also co-sponsors short courses with the FAA that are open to any FAA, federal government, or industry affiliate employee interested in air transportation systems analysis. The short courses are designed for mid-senior level managers and decision makers and are taught by faculty members from the NEXTOR universities.

## Knowledge Transfer

Through research and educational opportunities, NEXTOR gains a wealth of information that benefits the aviation community. The information gained is presented and discussed with the academic and industrial community through NEXTOR's conference and seminar series. The series includes 2-3 conferences per year and past conferences have dealt with topics including performance metrics, NAS capacity and the environment, resource allocation, strategies for dealing with airspace congestion, as well as numerous operational topics.



## Additional Information

For up-to-date information concerning NEXTOR's educational opportunities, short-courses, conference seminar series schedule, and more in-depth explanation of our programs, please visit our website at <http://www.nextor.org> or contact:

## Scott Simcox

NEXTOR Program Manager and  
Research Development Director  
107 McLaughlin Hall  
Berkeley, CA 94720-1720  
Phone: (510) 643-5635  
Cell: (408) 476-5196  
email: [simcox@uclink.berkeley.edu](mailto:simcox@uclink.berkeley.edu)