

# First International Air Transportation Research and Development Symposium

June 24<sup>th</sup> – 27<sup>th</sup> 2025, Prague, Czech Republic

## CALL FOR PAPERS

### Conference Overview

Since 1997, the Federal Aviation Administration (FAA) and EUROCONTROL have jointly organized two prominent series of scientific conferences in air transportation: the Air Traffic Management (ATM) Research and Development (R&D) Seminar and the International Conference on Research in Air Transportation (ICRAT). These events have been hosted in various US and European locations, and most recently in Asia, fostering the exchange of research results and building consensus on key issues in air transportation and ATM. The conferences have been instrumental in creating and reinforcing professional relationships among leading experts and researchers. Papers presented are publicly available on our websites, forming a valuable repository of air transportation research.

### New Conference Format

While the ATM R&D Seminar took place in odd years and reached out to senior scientists, ICRAT predominantly addressed young researchers and took place in even years. To streamline and enhance the impact of these conferences, the FAA and EUROCONTROL are merging the ATM R&D Seminar and ICRAT into a new annual event: the International Air Transportation Research and Development Symposium. The Symposium will integrate the best elements of both previous conferences. Still based on an open Call for Papers, the Symposium will also feature tutorials on selected topics and a doctoral research review component. Industry members are encouraged to attend to facilitate the transfer of research from academia to practice.

### Call for Papers

The Programme Committee (PC) invites research papers that present new concepts, analyses, and methodologies in one of the themes set out below. Papers may address any part of the lifecycle from early concept to implementation. The Committee also considers papers that demonstrate the infeasibility of certain concepts (negative results), deployment experiences with valuable lessons as well as papers that describe and analyse relevant innovative concepts and emerging technologies. Papers describing research and concepts that apply globally will be looked upon favourably, as will contributions arising from collaboration between different organizations, especially joint international efforts.

The Symposium invites contributions in two categories with the criteria listed below:

1. **Full Papers** (up to 10 pages) - Submissions must provide a clear explanation of their objectives, approach, methodology, and results, and draw conclusions that underscore the scientific value of the work. Papers lacking clear results will be rejected. Authors are required to reference previous work, such as from the ATM Seminar and ICRAT, which collectively contain a huge repository of scientific publications (see [www.atmseminar.org](http://www.atmseminar.org) and [www.icrat.org](http://www.icrat.org)). Papers that duplicate content presented at other conferences or similar forums will not be accepted.
2. **Doctoral Research Papers** (up to 4 pages) – Young researchers are encouraged to submit papers presenting ongoing or recently completed PhD research. The symposium provides a supportive environment where doctoral students can receive constructive feedback from experienced researchers. Submissions should be in English and detail the research, approach, and preliminary results as well as relevant references.

### Submission Guidelines

Submissions should be made through EasyChair in either of the two categories mentioned above. Instructions and templates are available on [www.atmseminar.org](http://www.atmseminar.org) and [www.icrat.org](http://www.icrat.org).

## Important Dates

- **Submission Deadline:** February 4th, 2025
- **Notification of Acceptance/Rejection:** April 15, 2025

Submissions will be peer-reviewed by at least three committee members according to the criteria indicated above. Submissions should be considered final versions, although the PC may request minor revisions to improve readability. Authors of accepted papers are required to attend the entire symposium. Best paper awards will be presented, and accepted papers will be indexed in SCOPUS and assigned a DOI. Top papers may also be featured in a special journal issue.

## Conference Co-Chairs

- Eric Neiderman, FAA
- Dirk Schaefer, EUROCONTROL

**Doctoral Symposium Chairs:** Dave Lovell, University of Maryland, and Hartmut Fricke, TU Dresden

**Tutorial Chairs:** Michael Schultz, University of the German Armed Forces, and Yu Zhang, University of South Florida

**Industry Chairs:** Akbar Sultan, NASA, and Miguel Vilaplana, Airbus

**Communication Chairs:** Sameer Alam, Nanyang Technological University Singapore, and Max Li, University of Michigan.

## Student Funding

Limited funding will be available for student presenters who require financial assistance to attend the symposium. Such assistance can be requested under specific conditions by the first authors of a doctoral paper. Details will be published with the notification of acceptance of doctoral papers.

## Conference Themes

The following descriptions outline the scope of each theme as envisaged by the Programme Committee. These are not exhaustive, so related subject matter not explicitly mentioned may be submitted. The committee reserves the right to shift submitted papers to themes other than those specified by the authors. These topics are relevant for Full Paper and Doctoral Paper submissions alike.

### Air traffic flow management and optimization

FAA modernization programs and SESAR promote efficient use of airport and airspace resources through strategic flow management and optimization from the perspectives of both carrier and service providers. This theme includes concepts of collaborative decision-making (CDM) for enhanced efficiency and congestion relief.

### 4-D Trajectory planning, prediction, and management

A key paradigm of FAA modernization and SESAR is the shift of control from tactical clearance to management by reference to a trajectory. Topics in this theme include all aspects of trajectory planning, prediction, optimization, and coordination including real-time updates and traffic synchronization. Also included are tools and procedures for queue management such as arrival, departure, and surface manager.

### Separation assurance and safety nets

This theme encompasses concepts, algorithms, analyses, and systems that address tactical separation in the air and on the airport surface. Topics include methods and models for assessing separation

requirements; ground-based, airborne, and combined approaches for safety alerting and conflict resolution; and wake turbulence management.

### **Advanced communications, navigation and surveillance (CNS)**

This theme includes concepts for advanced secure and resilient communications, navigation, and surveillance, and associated procedures for diverse operations (e.g., legacy aircraft, small unmanned aircraft, Advanced Air Mobility (AAM), and high-altitude aircraft). Topics may include the use of novel surveillance technologies, digital communications, Alternative Position Navigation and Timing (APNT) systems, spectrum allocation, and performance-based navigation procedures.

### **Integrated airport/airside operations**

This theme includes models and analyses of airport surface operations and the coordination of local airport management decisions (e.g., gate allocation) with the surrounding airspace constraints. Goals can include mitigating delays on scheduled airport operations; optimization of runways/taxiways; managing airspace delays and congestion; and reducing environmental impact. Topics include airport performance assessment, dynamic scheduling of airport/airspace resources, Airport CDM (A-CDM), and other relevant aspects of airline operations. The integration of diverse operations (e.g., eVTOLs) at existing airports and heliports is also included.

### **Economics, finance, and policy**

This theme includes air transport policy and strategy analysis; economic incentives to change the behavior of air transport actors; the financing of air traffic services and modernization initiatives; and investment analysis of air transportation improvements. Also relevant are airport access control policies, equipage mandates/incentives, and adaptation to climate change. The appropriate roles of government, air navigation service providers (ANSPs), and industry can be discussed along with trade-offs between competing policy goals. Case studies in air transportation with policy implications, including regulation, are also welcomed.

### **ATM performance measurement and management**

Topics of interest include prediction, measurement, control, and optimization of one or more dimensions of air transportation system performance including safety, capacity and delays, cost and flight efficiency, punctuality, predictability, and environmental impact. Empirical, analytical, and model-based studies for individual programs and the system as a whole, both within and across ANSPs, are welcome. Note that research on human performance should be submitted under the theme 'Automation, Human factors, and decision support systems'.

### **Safety, resilience, and security**

Safety and resilience topics of interest include current and future approaches for risk mitigation; contributions from future technology and automation to safety management; and the assessment of system and human response to unexpected operating conditions. This theme also includes contributions that specifically address the assessment and mitigation of events that take place on a local or global scale and pose a threat to the aviation ecosystem such as pandemics, geo-political conflicts, and climate-related disruptions such as floods and extreme weather. Security topics of interest include cybersecurity, GNSS jamming/spoofing, the physical protection of airports and other critical ATM infrastructure, and unwanted UAS activity.

### **Environment and energy efficiency**

This theme addresses the impact of aviation operations on the environment and operational measures to mitigate these impacts and enhance energy efficiency. Topics include operational measures to improve the performance of the air transportation system from an environmental and energy efficiency perspective; analyses of impacts of existing and new aircraft and other new technologies on the environmental performance of the air transportation system, including contrail formation; and research to enable the operational implementation of sustainable aviation technologies and energy sources.

### **Weather in Air Transportation**

This theme includes the integration of weather information into ATM and aviation decision-making to understand and mitigate its impact on operations. Topics include quantifying the impact of weather on air

traffic operations, decision-making in the face of forecast uncertainty, and general considerations of the role of weather and weather forecasting in the practice of ATM.

### **Automation, Human factors, and decision support systems**

Human factors issues include human-system integration, AI assistant tools and human-AI teaming, decision-making, training, controller selection and performance monitoring, organizational dynamics, change management, individual and team performance, and adaptive automation. Topics also include tools, techniques, and metrics to enhance the performance of humans in ATM and aviation, advanced design methods, automation strategies, and the transfer of technologies/techniques from other domains.

### **Autonomous, unmanned and remotely piloted aircraft systems and emerging operations**

This theme focuses on enablers for the safe, efficient and scalable operations of UAS in low-altitude airspace, particularly in urban and high-density environments, as well as on the integration of UAS/RPAS and autonomous systems into ATM. Papers could also address synergies with high altitude and commercial space activities. Topics of interest include separation requirements; trajectory-based operations; dynamic network analysis of the decision loop from separation through traffic synchronization; design and analysis for increased autonomy to ensure safety, resilience and trust in the system; and human/automation interactions.