LEADING THE INDUSTRY IN UNMANNED AIRCRAFT SYSTEMS (UAS)
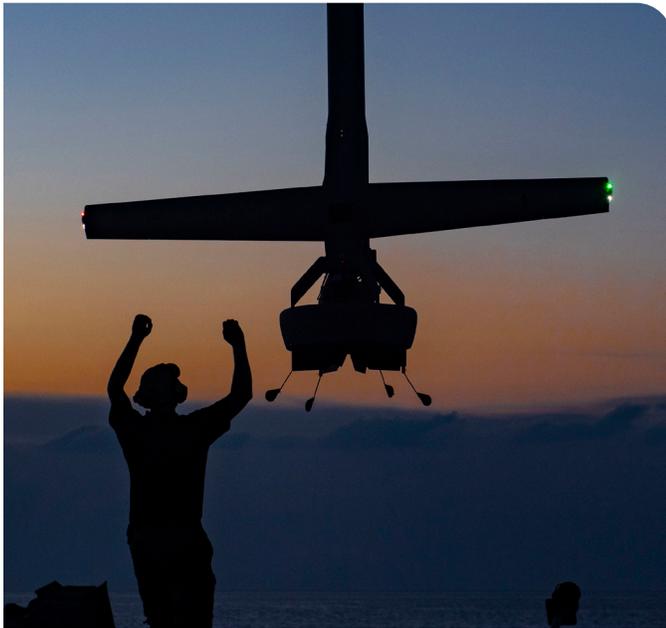
UAS TRAFFIC MANAGEMENT (UTM)

CNA has been a leader in conducting research, designing frameworks, and developing methodologies to build Cybersecurity measures for UAS. We support the development of the Federal Aviation Administration's (FAA) **UAS Traffic Management (UTM) requirements**, which represents a new paradigm in aviation traffic management. We apply forward-thinking strategies, such as **zero trust architecture**, in our cybersecurity strategy. Our design has been tested and demonstrated in forums such as the congressionally-mandated **UTM Pilot Program**. In addition, the agency is also leveraging the concepts and approaches from our analysis beyond UAS as it modernizes its systems across the enterprise to meet growing threats in the cybersecurity landscape.

Other examples of our work in support and partnership with the FAA, National Institute of Standards and Technology (NIST), and other federal, state, and local agencies include developing frameworks that help evaluate the vital cybersecurity needed for the expected growth in UAS traffic in the United States and designing an innovative cybersecurity protection for public safety drones.

CNA builds **custom models and simulations** to provide quantitative insights into challenging questions for aviation. We developed **UAS Cooperative Airspace Traffic Simulation (UCATS™)**, an agent-based modeling tool that simulates UAS flight planning in various package delivery scenarios to provide insights into airspace fairness for industry and government stakeholders.

AIR TRAFFIC MANAGEMENT

Our data-driven analysis has spanned the spectrum from legacy crewed aviation to new entrants such as UAS. We provide innovative data analytics and data science to the FAA Command Center and create data analytics visualizations to support **air traffic management operations** decisions by FAA leadership.

PUBLIC SAFETY

As a leader in engaging with state, local, tribal, and territorial communities and public safety agencies, CNA brings a data-driven approach to technology and analytical projects. Working with the Alliance for System Safety of UAS through Research Excellence (ASSURE), CNA leads analyses for government agencies such as FAA, NIST, and Federal Emergency Management Agency (FEMA) to evaluate a framework on **training**, **evaluation**, and **credentialing** to assess first responder proficiency in UAS operations. This certification program will ensure that first responders safely integrate UAS into operations at the federal, state, and local level. We also have extensive experience supporting technology integration to meet the needs of public safety organizations, such as research and analysis of body-worn camera data for Las Vegas and other police departments.

NATIONAL SECURITY STRATEGY

CNA brings eight decades of analytical expertise to assess the use of UAS to meet mission-critical National Security objectives. In one study, we performed comprehensive research outlining the current use of UAS by public safety industry to inform the **potential use of UAS for safety and security** on U.S. Navy installations. We helped the Navy make informed decisions about using UAS by highlighting the challenges and benefits of UAS in safety and security. Partnering with Virginia's UAS stakeholders, our team collaborated on use cases and requirements for unmanned technologies to enhance safety and security in the Hampton Roads maritime environment.

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ADVANCED AIR MOBILITY

CNA has partnered with **NASA's Urban Air Mobility (UAM)** team to conduct research and analysis focused on the cybersecurity needs of the UAM ecosystem. CNA's internal research identified a wide range of important cybersecurity topics that UAM needs to address, and the current focus of CNA's work for NASA is on Identity and Access Management.

In 2022, a CNA subject matter experts participated in the **"Secured Airspace for UAM"** workshop which highlighted cybersecurity concepts in UAM through panel discussions with a FAA IAM expert.

Link to the workshop:

https://nari.arc.nasa.gov/events/securedairspaceuam/
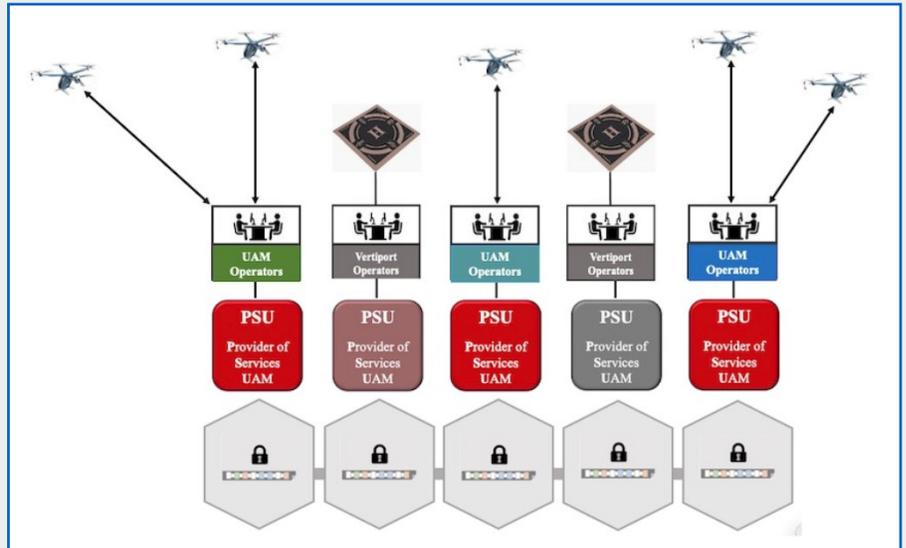
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (AI/ML)

We bring subject matter expertise in developing procedures for the approval or acceptance of AI/ML technology in aviation. CNA is developing a **certification framework** to help the FAA evaluate AI/ML technologies to ensure adaptive technologies are implemented safely and consistently across aviation and other government sectors. We research and analyze the functional aspects and requirements (e.g., non-deterministic AI models with autonomous control behaviors) of AI technologies in realistic aviation use cases and assess use cases for the FAA to employ novel AI/ML model to support **UAS Traffic Management**.

ABOUT CNA

CNA is a nonprofit research and analysis organization dedicated to the safety and security of the nation. It operates the Institute for Public Research — which serves civilian government agencies — and the Center for Naval Analyses, the Department of the Navy's federally funded research and development center (FFRDC). CNA develops actionable solutions to complex problems of national importance. With nearly 700 scientists, analysts and professional staff, CNA takes a real-world approach to gathering data, working side-by-side with operators and decision-makers around the world. CNA's research portfolio includes global security and strategic competition, homeland security, emergency management, criminal justice, public health, data management, systems analysis, naval operations and fleet and operational readiness.

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