Unmanned Aircraft Systems Research

There are many obstacles to overcome as unmanned aircraft systems (UAS) transition to the civilian airspace, including aviation regulations, public perception, and safety and privacy concerns. RTI International partners with universities and public agencies around the world to better understand the social, cultural, and behavioral factors that can facilitate or impede this process. Our work focuses on the safe and ethical insertion of UAS into a broad range of research programs.

Overview

UAS are used to perform a variety of military and civilian functions, including agricultural research and crop monitoring, 3-D mapping, infrastructure and bridge inspections, scientific research, and search and rescue missions. Still, the potential for unmanned aircraft technology is just beginning to be tapped. Market research estimates that the total global market for non-military drone use will generate at least $10.5 billion by 2024.

RTI has conducted several research projects related to UAS, both independently and through partnerships with other research organizations. For example, the Institute for Homeland Security Solutions—a cooperative research effort administered by RTI in cooperation with Duke University, the University of North Carolina at Chapel Hill, and the North Carolina Military Foundation—works with public agencies to study public opinion regarding UAS and identify innovative uses for unmanned aircraft.

RTI has a Research and Development test site operating under Federal Aviation Administration (FAA)–approval (Section 333). Additionally, we are working with North Carolina State University to conduct test flights at its FAA-approved location and with the University College Dublin, through the Applied Research Center, to leverage projects started in the United States to advance understanding of UAS issues in Europe. We also have test locations in Ecuador, Guatemala, El Salvador, Italy, and Greece. We are working with several partners in Latin America to use UAS for both public health applications and social science research.

Areas of Expertise

RTI offers multidisciplinary expertise in survey design and implementation, agricultural studies, sensor development, policy research, scientific communication, public health research, environmental studies, research involving human subjects, and quality assurance/quality control processes. By combining our broad expertise with specific experience in UAS-related research, we are well positioned to navigate clients through this relatively new area of study.

First-response applications—We can organize experts and consultants to advise first-response organizations, policymakers, and other stakeholders. We will work with state and local first responders to identify how UAS technology can best be implemented in specific environments and for different needs. We will prepare policy briefs and literature reviews, provide expert testimony, and conduct original research in response to first responder needs and emerging issues. As an international institute, we will coordinate through our

offices in Europe and other parts of the world to organize information sharing with first responders outside of the United States.

Best practices—To ensure that the development of UAS applications focuses on the human aspect of operations and the benefits to important research endeavors, we can develop best practices for protecting human subjects, engage privacy watchdogs to develop fair use standards, conduct population research on acceptance, and assess the impact of UAS programs on the general population at local, state, and national levels.

International development—RTI is also working with our offices throughout the world and our technology partners to develop UAS applications for developing countries. This work will include social surveys, disease monitoring, environmental exposure monitoring, and agricultural studies such as 3-D terrain mapping, crop health monitoring, and weed detection.

Project Highlights

The following is a sample of UAS-related research projects that RTI has conducted:

- Partnering with law enforcement organizations to develop innovative uses for UAS

- Examining the current and potential use of UAS by law enforcement and other public safety agencies to better understand operating skills requirements, use cases, and public reaction

- Commissioning research briefs on public perceptions and first responder–related issues for UAS

- Conducting general population surveys and social media analyses to examine public awareness and opinion about UAS in domestic airspace

- Collecting data on public opinion related to future UAS implementation into emerging markets and entering domestic airspace

- Working with stakeholders to gain insight into injuries that occur during operation of UAS

- Providing expertise in survey design, public health, and environmental health to organizations engaged in UAS testing and experimentation

- Studying research programs that use UAS to better understand technical and human factor requirements and developing guidelines for safe and appropriate use

- Investigating the potential for UAS use in public health and epidemiological applications to study disease outbreak and transmission

  – Developing methods to detect mosquito breeding sites to combat the Zika virus and malaria in developing countries

- Developing methods for social and behavioral research using UAS as a supplement for current techniques

  – Developing survey sampling methodologies that incorporate UAS imagery

- Coordinating industry groups to better understand the UAS transition process and identify areas in which policymakers, venture capitalists, industry leaders, and university experts can help facilitate the process

  – Designing UAS-assisted research models for the developing world in agricultural and environmental research

  – Developing 3-D flight simulators and training tools for new aircraft, sensors, and applications in the United States and internationally

- Developing search and rescue methods for emergency planning in extreme conditions

- Using UAS data and other remote sensing techniques to improve the safety and management practices of refugee camps

More Information

Joe Eyerman, PhD
Senior Director, Applied Social Sciences
+1.919.541.7139
eyerman@rti.org

RTI International
3040 E. Cornwallis Road, PO Box 12194
Research Triangle Park, NC 27709-2194 USA