

Airspace Management

Modern, effective airspace is the foundation for modern, effective air travel. Airspace design and management are critical functions in providing a robust system that meets the demands of current and future air commerce.

The MITRE Corporation's Center for Advanced Aviation System Development (MITRE/CAASD) is working with the aviation community to ensure the airspace that underlies and supports the National Airspace System (NAS) continues to operate at the highest levels of safety, security, and efficiency.

For the last decade, MITRE/CAASD has been a trusted partner and a key resource in many important airspace design actions. MITRE/CAASD has significant experience and expertise in all aspects of airspace modernization.

Problem Identification

The first step of any airspace redesign effort is to understand the underlying operational issues and to determine whether these problems can be solved with airspace design. This involves using diagnostic tools to look at traffic flows, identify operational bottlenecks or chokepoints, and ascertain potential solutions. MITRE/CAASD has one of the most complete sets of data analysis tools and data for airspace elements (routes, fixes, and boundaries) and current and projected traffic available today.

Design and Analysis of Alternatives

A good design must balance multiple factors: flexibility, predictability, efficiency, safety, security, and the environment. MITRE/CAASD combines years of airspace design expertise with a unique set of tools and operational innovation to facilitate large scale design. Many recent airspace efforts have also leveraged other corporate expertise in Area Navigation (RNAV) and Required Navigation

Performance (RNP). MITRE/CAASD's aligned capabilities were fundamental in the Federal Aviation Administration's (FAA's) successful large scale redesigns in South Florida and the Great Lakes Corridor. Other examples of MITRE/CAASD's efforts include design and analysis of ground-breaking, integrated airspace for the New York/Philadelphia metro areas, human-in-the-loop and fast-time models of airspace benefits in Chicago, operational and environmental analyses for the Houston area, and extensive analytical work for the FAA's new Optimization of Airspace and Procedures in the Metroplex program.

Implementation Engineering and Risk Mitigation

Moving from design to implementation is a large challenge. Technical, economic, and political risks are associated with every redesign effort. MITRE/CAASD capitalizes on its extensive corporate knowledge, in-depth knowledge of the NAS, and systems engineering background in identifying issues that will challenge project viability and development of effective mitigation plans.

Post-Implementation

The airspace redesign process is not complete once a design is implemented. Sometimes a design must be revisited and adjusted, to fully achieve the expected benefits or to mitigate unforeseen negative impacts. Measuring the effectiveness of the effort is also important. MITRE/CAASD has played a major role in post-implementation efforts for several major projects, including both design alteration and impact measurements.