



User Request Evaluation Tool (URET)

The User Request Evaluation Tool (URET) is a system developed by The MITRE Corporation's Center for Advanced Aviation System Development (MITRE/CAASD). It provides decision-support capabilities for en route air traffic control, including aircraft trajectory modeling, aircraft and airspace conflict detection, flight data management, and strategic planning capabilities. Under the Federal Aviation Administration's Free Flight Program, URET has been deployed to several Air Route Traffic Control Centers and will complete National deployment by 2006.

URET Capabilities: URET combines real-time flight plan and radar track data with site adaptation, aircraft performance characteristics, and winds and temperatures aloft to construct four-dimensional flight profiles, or trajectories. For active flights, it also adapts itself to the observed behavior of the aircraft, dynamically adjusting predicted speeds and climb and descent rates based on the performance of the flight as it is tracked through en route airspace.

URET's predicted trajectories are used to continuously detect potential aircraft conflicts up to 20 minutes into the future and to provide strategic notification to the appropriate sector.

By contrast, earlier systems had a much shorter, or tactical, "look-ahead" capability. Trajectories also provide the basis for the system's trial planning capability, which allows the controller to check a desired flight plan amendment for potential conflicts before a clearance is issued. The controller can then construct the amendment from a trial plan with the click of a button. The controller interface to these detection and resolution capabilities supports flight data management and task prioritization using both text and graphic displays. Quick access to system functions and entry of flight plan amendments are accomplished using a point-and-click interface.

System Development Model: Since the first URET prototype system was installed at the Indianapolis Air Route Traffic Control Center in 1996, it has undergone substantial upgrades. System capabilities were developed using an evolutionary model. At each step, enhancements were introduced to teams of operational personnel and evaluated under simulated and live

traffic conditions. Upgrades and refinements were added to the system accordingly. This close interaction between the operational personnel in the field and scientists and engineers at MITRE/CAASD is at the heart of the collaborative evolution that has made URET a successful program and a key component of the National Airspace System.

Operational Benefits: URET capabilities provide many operational advantages to both the controller and the airspace user. Overall, the system enables more efficient routes and altitudes to be flown because of the accurate trajectory and conflict information it provides. Strategic problem identification also enhances safety and decreases uncertainty in the long-term effects of flight plan amendments. Furthermore, URET enables the enroute controller to better handle anticipated growth in the volume and complexity of air traffic.

Current Activities: MITRE/CAASD continues to build upon the core components of URET—its trajectory modeling and conflict probe functions—to develop the next set of decision-support capabilities at the sector: problem resolution for aircraft and airspace problems, assistance for executing traffic flow initiatives, and support for handling traffic under severe weather conditions. Lessons learned are incorporated into plans for longer-term research and evolution of air traffic management capabilities in the United States and other countries seeking to modernize their systems.

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