



# Airports

**T**he MITRE Corporation's Center for Advanced Aviation System Development (MITRE/CAASD), a federally funded research and development centers sponsored by the United States Federal Aviation Administration (FAA), has extensive experience supporting efforts throughout the global aviation community in addressing many of the issues facing the planners and designers of tomorrow's airports. In our state-of-the-art laboratory facilities, we use modeling, simulation, and rapid prototyping to analyze problems and propose solutions to meet customer requirements.

**Airport Analysis.** We have in our laboratories sophisticated analysis tools that help airport planners and designers evaluate complicated issues. We can perform modeling analyses to study the relationships between key operations. We have the capability to design integrated processes to enhance capacity while noise is kept to a minimum and to support airport concepts of the future. We have extensive experience to support the design and evaluation of airport command and control centers. Our staff includes airport designers, air traffic controllers, pilots, and airport managers.

**Airport Capacity, Delay, and Noise Modeling.** Defining and measuring capacity is an extraordinarily complex problem because of the numerous variables involved in the process of measuring the maximum throughput of a single runway (or a runway system) at a given airport. MITRE/CAASD developed many of the models that the FAA uses today to perform these analyses. We have validated the results of our mathematical models with statistics from actual airport operations. Variables such as arriving aircraft mix, interarrival times, runway occupancy times, and the physical layout of multiple runways have been successfully included in our models.

Two basic ways to increase air traffic capacity in a metropolitan area are: the construction of new airports or new runways at existing airports and the improvement of established arrival and departure

procedures. MITRE/CAASD has focused its technical resources to create methodologies that will help existing airports best utilize available resources. For example, MITRE/CAASD has developed procedures for simultaneous approaches to parallel runways that permit reduced separation between the runways without sacrificing safety. We have also developed new procedures for simultaneous approaches to converging runways and triple-parallel approaches. These capacity enhancements often minimize delay and resolve environmental issues.

MITRE/CAASD has extensive experience with the use of models that analyze and predict aircraft acoustic profiles or contours ("noise"). Our studies often include long-term acoustic contour predictions for a number of alternative air traffic demand scenarios. Furthermore, our analyses do not conclude with the evaluation of the situation. We suggest alternatives to diminish the severity of the problem. One such example was a comprehensive analysis for Aéroports de Paris (ADP) to evaluate the impact of new runway construction and future traffic at Paris Charles de Gaulle Airport.

**Conclusion.** We are qualified to support a great variety of projects, including development, operational and technical analyses, feasibility studies, and cost-benefit analyses. In addition, we can develop hardware and software specifications, perform technical evaluation of bids, and supervise project implementation. We have demonstrated our capabilities through many United States projects, including such major airports as Dallas/Fort Worth and Chicago O'Hare, and starting in the late 1950s, in over 40 nations.

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