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Exploring NextGEN Aviation Technology for Efficient Approaches

A call for Next Generation (NextGEN) aviation technology has made known its urgency in the midst of several factors. An increasingly green-aware America forecasts reduced emissions and fuel consumption while an ever-growing population of consumers increases demand for air traffic, noise control, cheaper flights, and above all – improved safety. In this study, we examine the transition from conventional terminal approach procedures to a NextGEN trajectory-based concept of operation known as Required Navigation Performance (RNP). Equipage for RNP already exists in aircraft all over the world for local airports to test with, but is not usually utilized in high traffic operations. As its push for expansion looms in the near future, we will study key effects such as false alert rate and system strain. We will report on the overall effectiveness and safety while integrating RNP policies into a real world, high-capacity system. We will combine two computer systems for our test methodology: TTSAFE (Terminal Tactical Separation Assured Flight Environment), a system engineered at NASA Ames for aircraft conflict detection and resolution, and Georgia Tech's WMC (Work Models that Compute), for physics and human cognitive modeling of the aircraft and their pilots.