# NextGen - Wake Turbulence (FY16 – A12.a)

## Project Description

The NextGen – Wake Turbulence Program is in support of the DOT Strategic Goal of Economic Competitiveness. It is addressing the problem that air traffic control (ATC) wake mitigation standards, procedures and processes, while safe, are overly constricting the nation's airspace and airport runway throughput capacity. The last full review of the wake separation standards used by air traffic control occurred in the early 1990's. However, air carrier operations and fleet mix have changed dramatically, airport runway complexes have changed and new aircraft designs (A-380, very light jets, unmanned aircraft systems) have been introduced into the NAS. Flight delays occur at the NextGen Core airports during inclement weather events largely because air carriers' flight schedules assume good weather. The 20 year old wake separation standards and procedures provided safe separation of aircraft from each other's wakes; but, wake research had already shown that more capacity and throughput efficient wake mitigation arrival, departure and en route procedures/processes could be developed for the NextGen near-, mid- and far-term ATC operations. Based on the research from this program, wake separation standards have been modified by ATC Orders 7110.308, 7110.316 and 7110.659A; and, have provided envisioned runway throughput capacity enhancements. These gains in runway throughput capacity however do not satisfy the runway and airspace throughput demands of today and the NextGen mid- and far-term.

## FY14 Accomplishments

- Developed wake separation recommendations for the Airbus A-350 series aircraft working with the European Aviation Safety Agency, EUROCONTROL, and the Airbus Company.
- Completed initial alternatives tradeoff analysis on potential development approaches for the Wake Turbulence Mitigation Single Runway decision support tool.
- Completed development of an aircraft flight data recorder screening tool that is able to detect likely wake encounters (minor or less). Screening results will be used to help establish the statistical frequency of wake encounters occurring in today's operating environment.
- Continued support of RTCA Special Committee 206 as it progressed in the development of avionics design standards for the transmission of aircraft weather observations to the ANSP and to surrounding aircraft. Real time wind data observed by aircraft along its flight path is vital to the beneficial functioning of future ATC decision support tools supporting the dynamic wake mitigation separations between aircraft – both in the terminal area and in the en-route portion of flight.
- Designed initial Enhanced Wind Forecast Model that will ingest aircraft observed wind information in addition to inputs from the airport ASOS and the NWS Rapid Refresh forecast model

## Issue

The pressure to maintain the current FAA R,E&D budget level in FY15 and FY16 and Congressional requests to expand parts of the FAA research program have caused the NextGen – Wake Turbulence research project to have decreased funding in the President's FY15 Budget Request and in the future planned FY16 Budget Request. The project's probable decreased funding in these future years has caused a re-plan of the wake research tasks. The re-plan delays further development of statistical wake encounter models, eliminates further flight data recorder screening to gather statistical information on non-to-minor impact potential wake encounter events, and reduces the pace of gathering and analyzing data sets on wake turbulence generated by various aircraft types. The result will likely be overly conservative wake mitigation requirements being placed on NextGen era operations, due to lack of high confidence information on aircraft generated wake transport and decay.