Airspace Technology Demonstration 2 (ATD-2)

Analysis of APREQ Flights at CLT

May 22, 2019
Objective

Quantify impact of IADS Phase 1 & 2 capabilities on APREQ flights at CLT with respect to:

• Compliance to the Controlled Take Off Time (CTOT)

• Benefits for APREQ flights that use IDAC to renegotiate for an earlier CTOT

• Benefits of pre-scheduling APREQ flights using the Earliest Off Block Time (EOBT)

• Relationship between EOBT compliance and rescheduling CTOT
Steady increase of APREQ compliance over the life of the project. Reduced variation in compliance leading to improved predictability.
The most substantial APREQ compliance improvements started with Phase 2 capability (AEFS integration, ZTL IDAC, pre-scheduling and scheduler updates).
IADS Phase 1 & 2 Benefit Mechanisms

1. Collaborative surface metering
   - Reduced engine run time
   - Reduced fuel consumption and emissions

2. Overhead stream operational integration
   a. Scheduling controlled flights at the gate
      - Reduced engine run time
      - Reduced fuel consumption and emissions
   b. APREQ renegotiating for an earlier slot
      - Reduced total delay
      - Passenger value of time and crew costs
      - Reduced engine run time
      - Reduced fuel consumption and emissions

Benefits (1) and (2a) achieved through tactical gate holds
Benefit (2b) achieved through APREQ renegotiation process described below

Step 1: APREQ flight has a release time but is capable of taking off earlier
Step 2: FAA TMC uses the IDAC green space / red space to identify and request an earlier slot in the overhead stream
Step 3: Aircraft receives earlier release time and the difference between the release times is the reduction in delay
270.7 hours of delay saved by electronically renegotiating a better overhead stream time for 2,071 flights.

- The benefits described here are associated with better use of existing capacity in the overhead stream, and technology to reduce surface delay.
- These benefits are in addition to (distinct from) surface metering savings.
Substantial Improvements in predictability of delay for the last 5 months
EOBT Compliance / CTOT Reschedule for Pre-Scheduled Flights into KATL

[Graphs showing distribution of departures and cumulative percentages for different rescheduling scenarios]
Wrap-up

• Compliance to the CTOT has improved throughout the lifecycle of ATD-2 with biggest improvements following the introduction of Phase 2 capabilities

• Rescheduling APREQ flights using IDAC has reduced 270.7 hours of delay at CLT

• Predictability of local surface delay for APREQ flights is substantially improved via pre-scheduling with the IADS system

• Pre-scheduled flights that reschedule for later times tend to call ready later with respect to EOBT