



Airspace Technology Demonstration 2 (ATD-2)

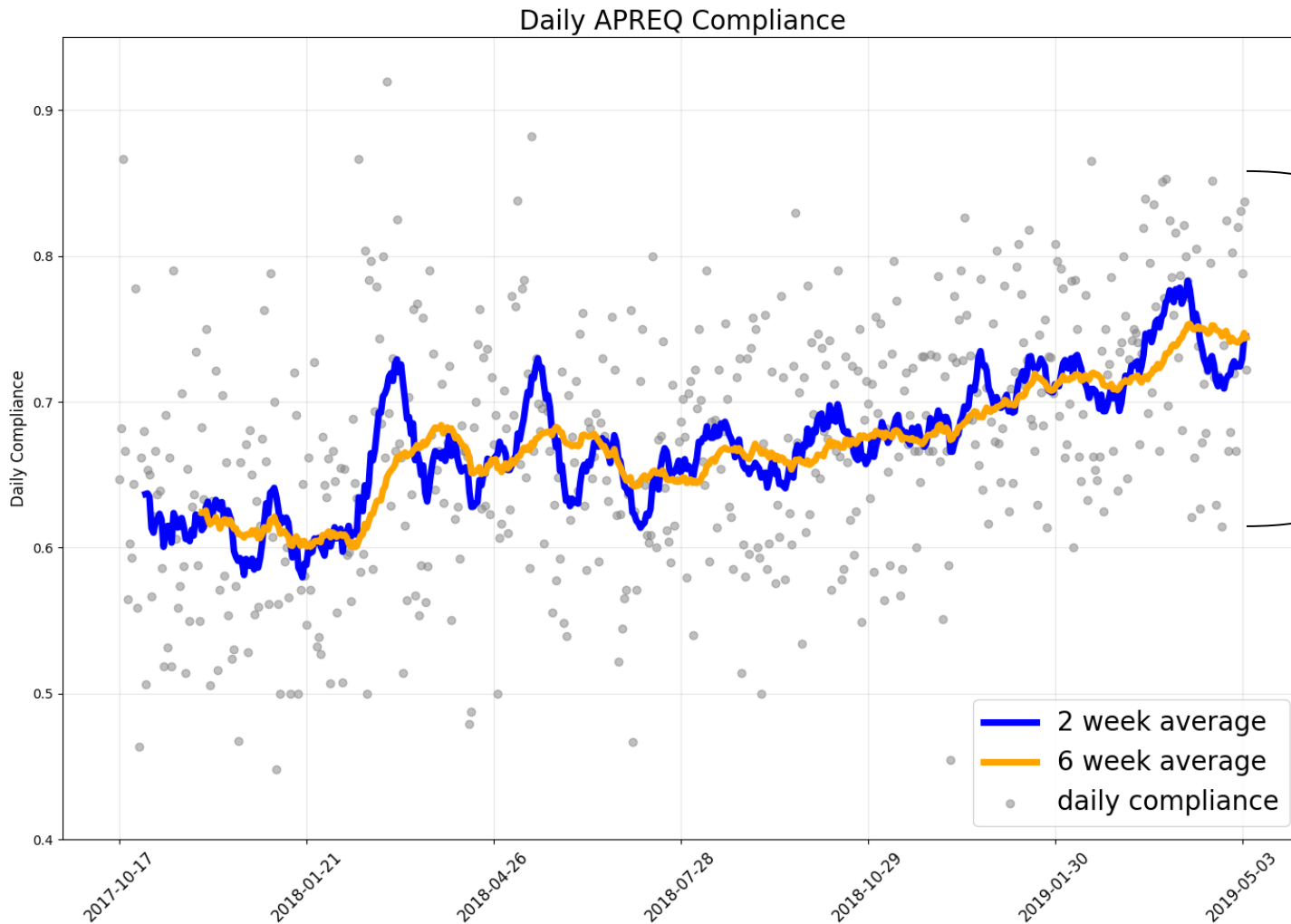
Analysis of APREQ Flights at CLT

May 22, 2019

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

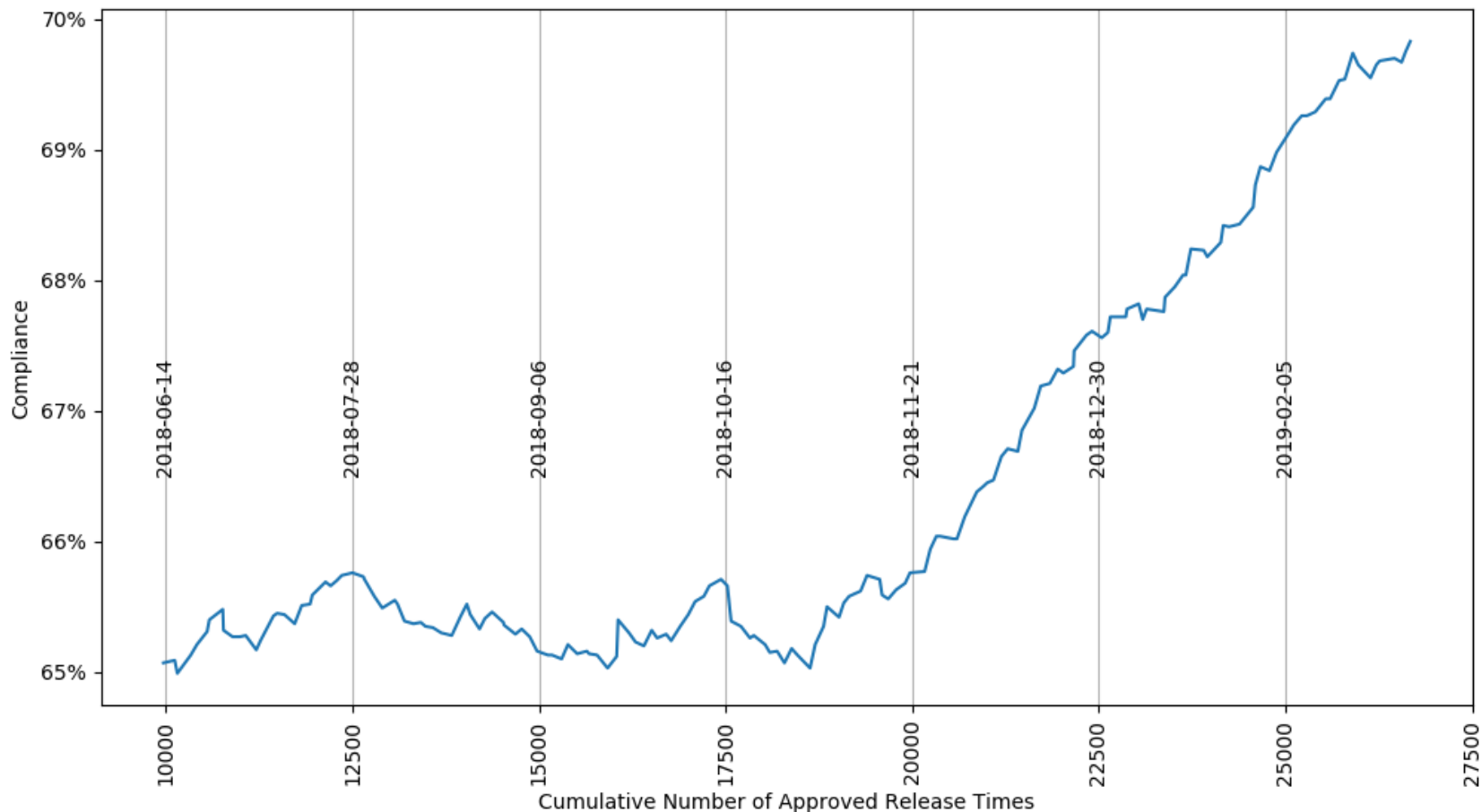
- Compliance to the Controlled Take Off Time (CTOT)
- Benefits for APREQ flights that use IDAC to renegotiate for an *earlier* CTOT
- Benefits of pre-scheduling APREQ flights using the Earliest Off Block Time (EOBT)
- Relationship between EOBT compliance and rescheduling CTOT

CLT APREQ Daily Compliance (Compliance Improvement Since ATD-2 Start)



In addition to overall improved compliance into TBM systems, the predictability is **increasing**

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).

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

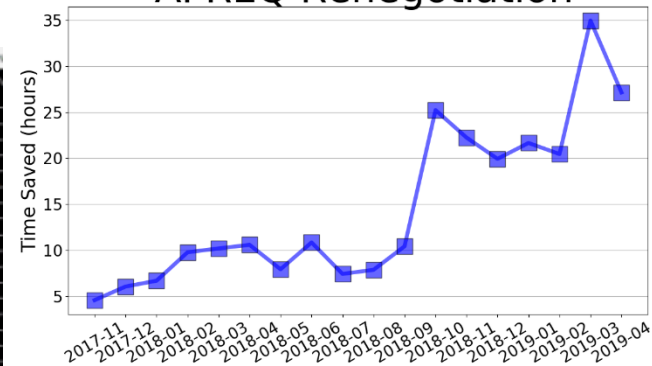
Step 3: Aircraft receives
earlier release time and
the difference between
the release times is the
reduction in delay

Benefits for APREQ flights using IDAC to renegotiate for *earlier* CTOT

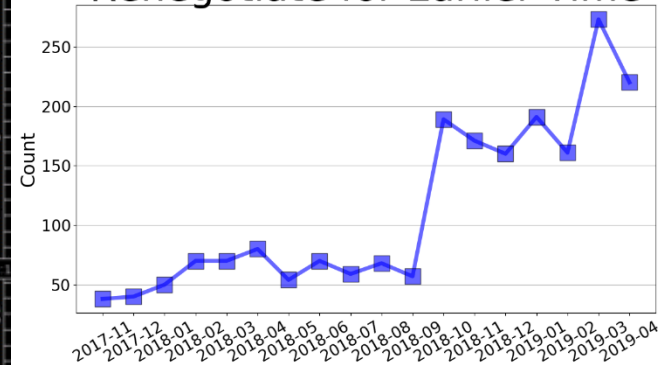


270.7 hours of delay saved by electronically renegotiating a better overhead stream time for 2,071 flights.

Time Saved by IDAC-related APREQ Renegotiation

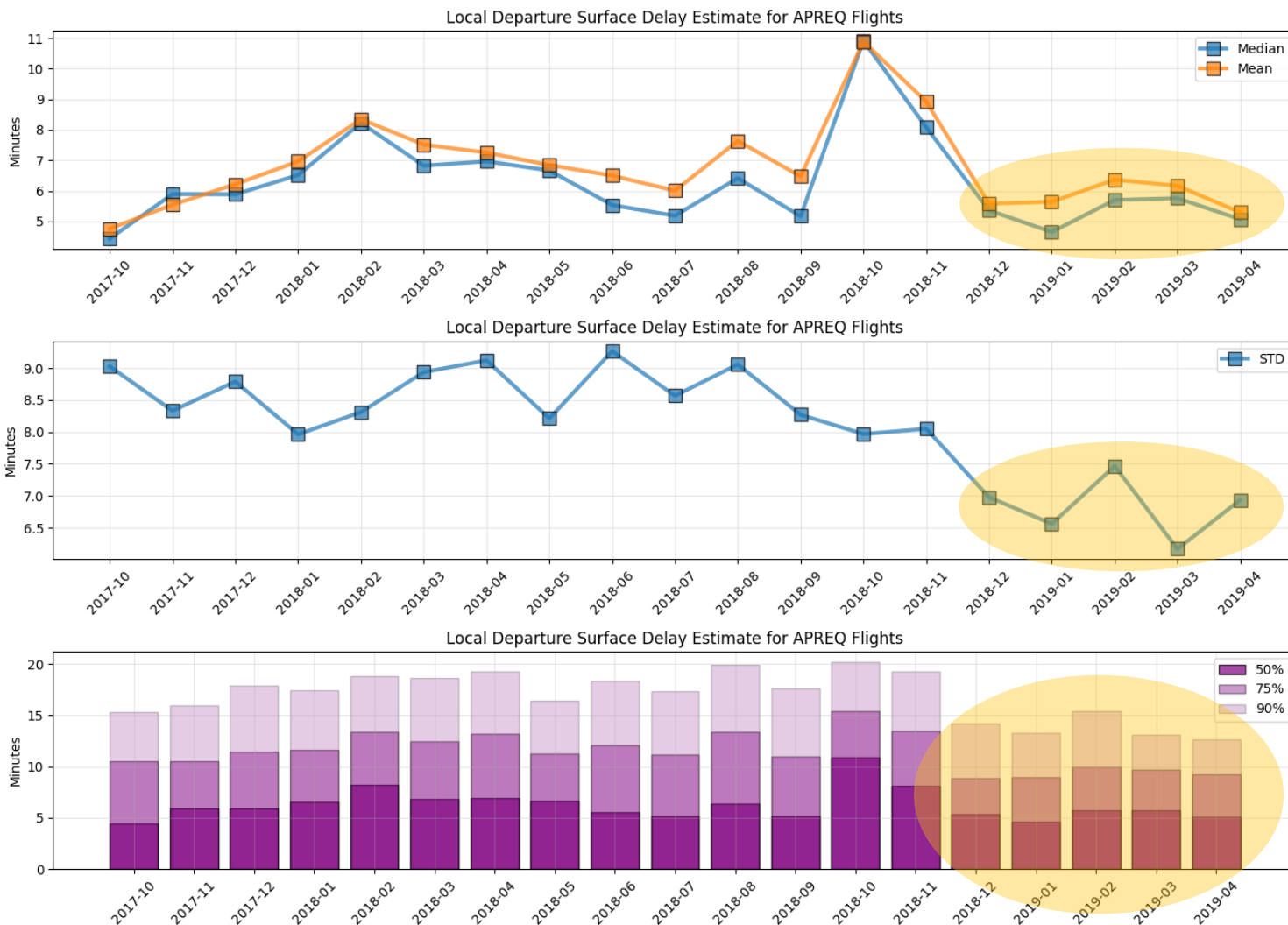


Count of Departures that Renegotiate for Earlier Time



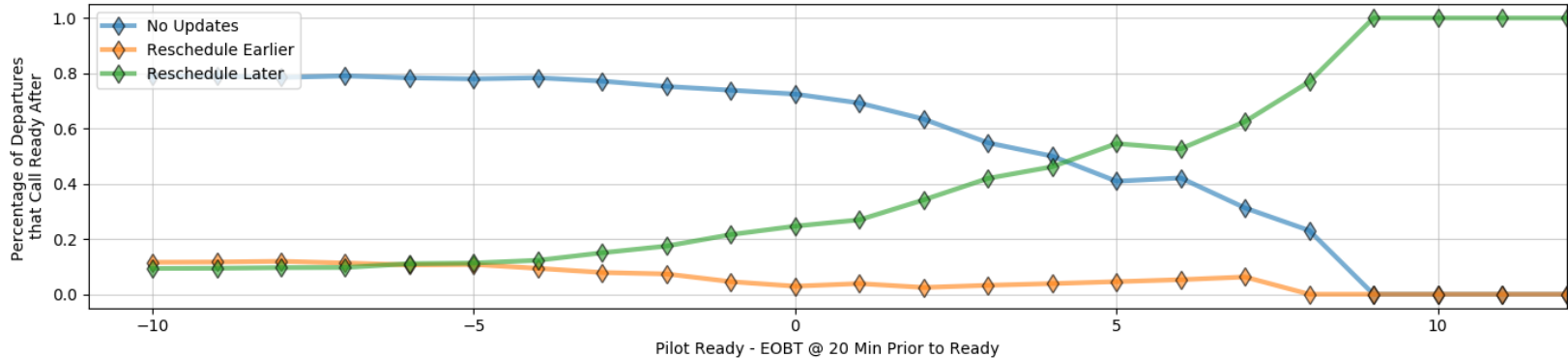
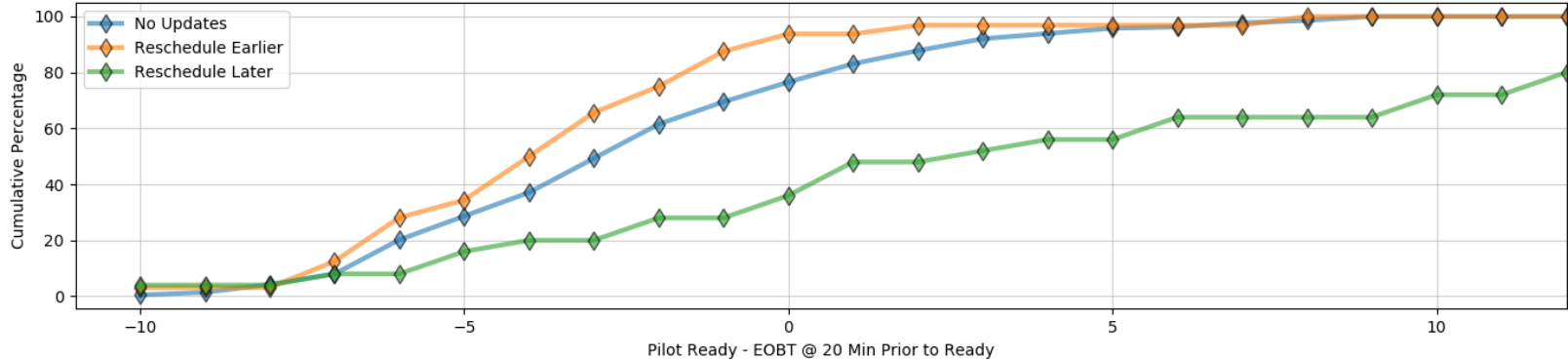
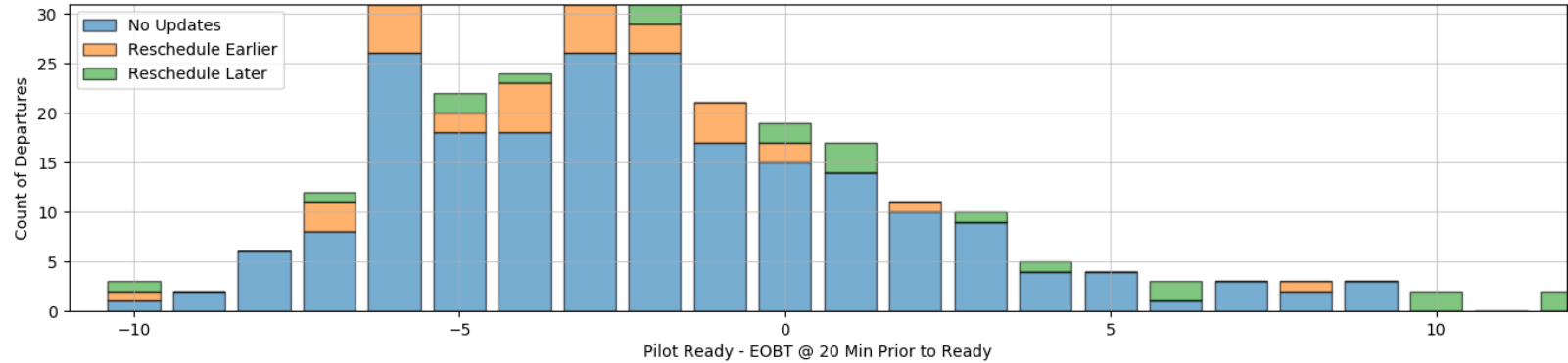
- The benefits described here are associated with better use of existing capacity in the overhead stream, and technology to reduce surface delay.
- These benefits are in addition to (distinct from) surface metering savings.

APREQ Delay For Pre-Scheduled Flights into KATL Have Been Reduced and are More Predictable For the Last Five Months



Substantial Improvements in predictability of delay for the last 5 months

EOBT Compliance / CTOT Reschedule for Pre-Scheduled Flights into KATL



- 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