Benefits of surface departure metering while ’doing no harm’ to other operational metrics

Airspace Technology Demonstration 2 (ATD-2)
Industry Workshop

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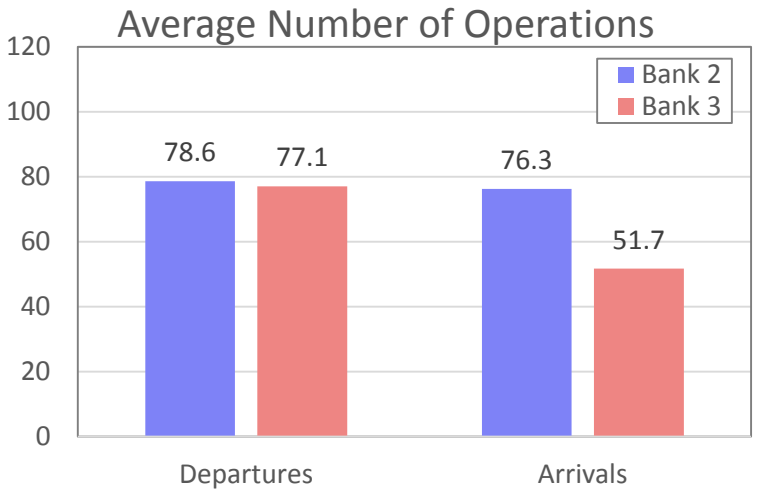
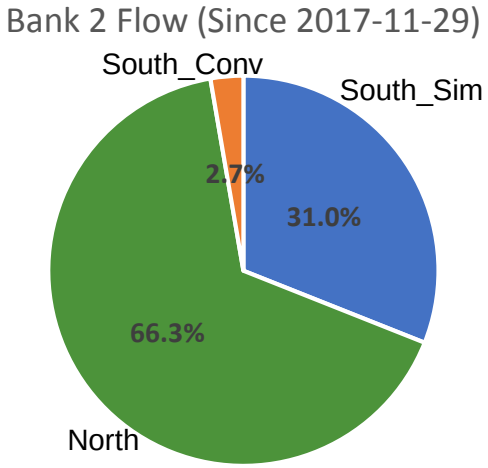
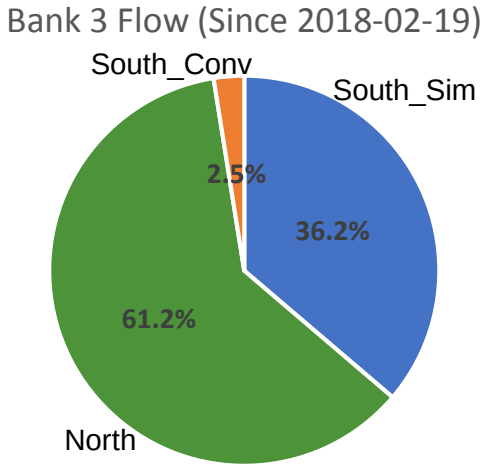
Surface Metering Usage

- Surface metering started in late Nov 2017 (Phase 1C)
  - Bank 2 was metered in 472 of 609 (77.5%) 2017-11-29 to 2019-07-31
  - Bank 3 was metered in 369 of 527 (70.0%) 2018-02-19 to 2019-07-31
- Bank 2 and Bank 3 have similar number of departures
- Bank 2 has 47.6% more arrivals than Bank 3 which causes increased surface congestion





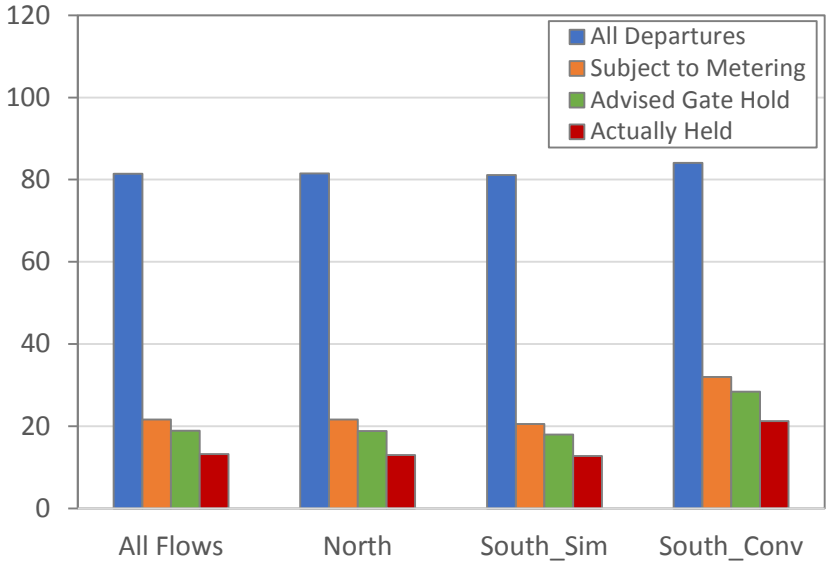


Avg. Number of Departures During Metering

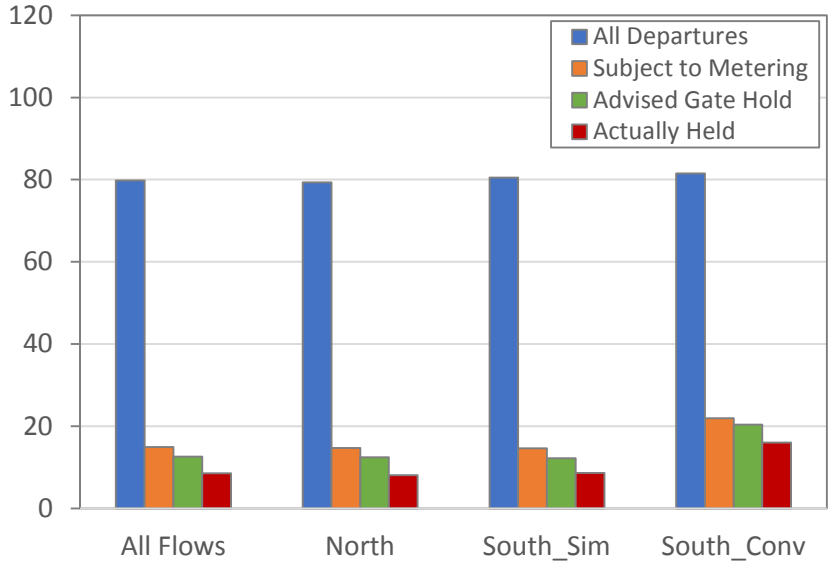
- More departures were subject to metering and held at the gate in bank 2 compared to bank 3

- Among all the departures in Bank 2 (Bank 3)
  - 26.6% (18.7%) of departures were subject to metering
  - 23.2% (15.8%) of departures were advised a gate hold
  - 16.2% (10.7%) were actually held at the gate

Bank 2: 2017-11-29 to 2019-07-31

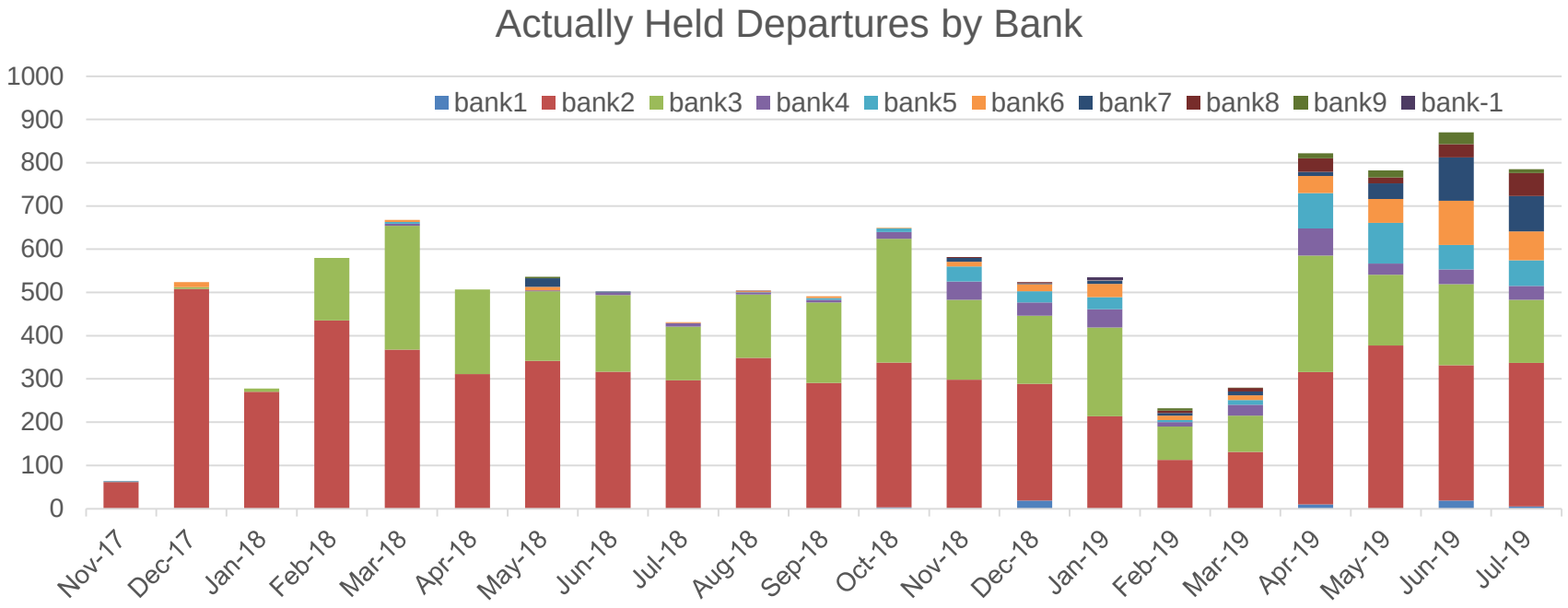


Bank 3: 2018-02-19 to 2019-07-31

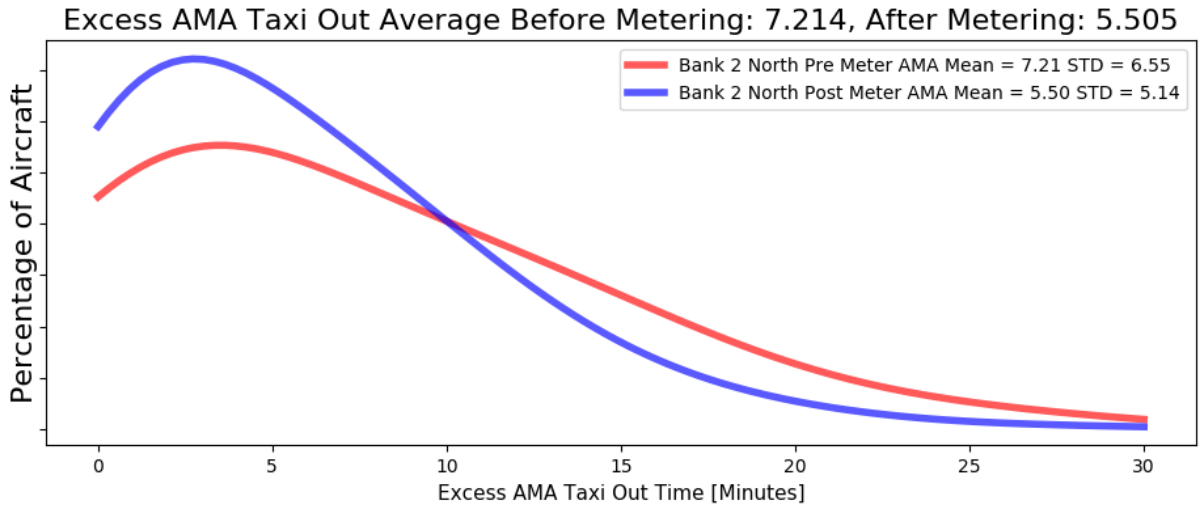


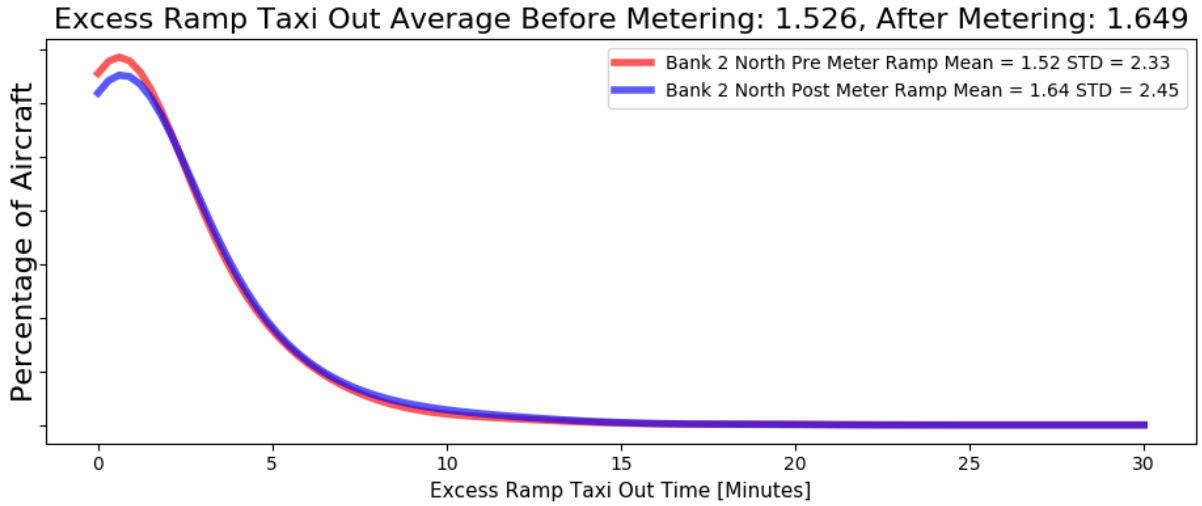
Surface Metering by Bank

- Surface metering extended beyond Bank 2 & 3 since October 2018



Bank 2 North Flow Excess Taxi Out Time





By reducing the percentage of flights with AMA excess taxi out greater than 10 minutes we reduce average taxi time

IADS Phase 1 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

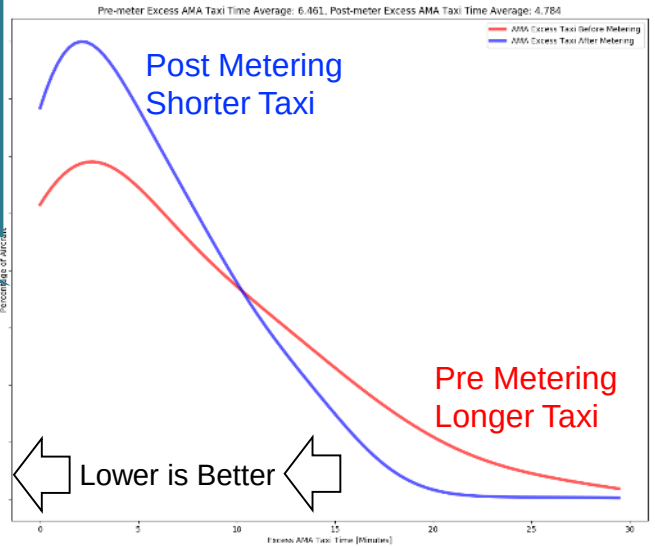
Step 2: FAA TMC uses the IDAC green space / red space to identify and request an *earlier* slot in the overhead stream

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

Collaborative Surface Metering Benefits 2017-11-29 though 2019-07-31

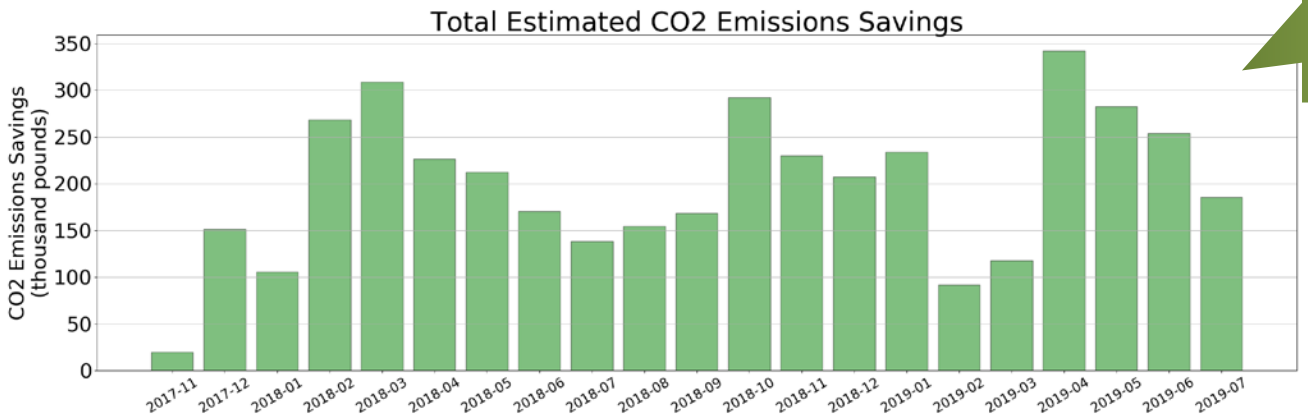
Initial benefits observed from S-CDM surface metering at CLT

Reduced AMA taxi out times during its use via small holds at gate



AMA Excess Taxi Duration

Saved approximately 1,351,286 lbs of fuel by holding 13.8% of departures with average gate hold of 5.9 minutes. Benefit mechanism (1).

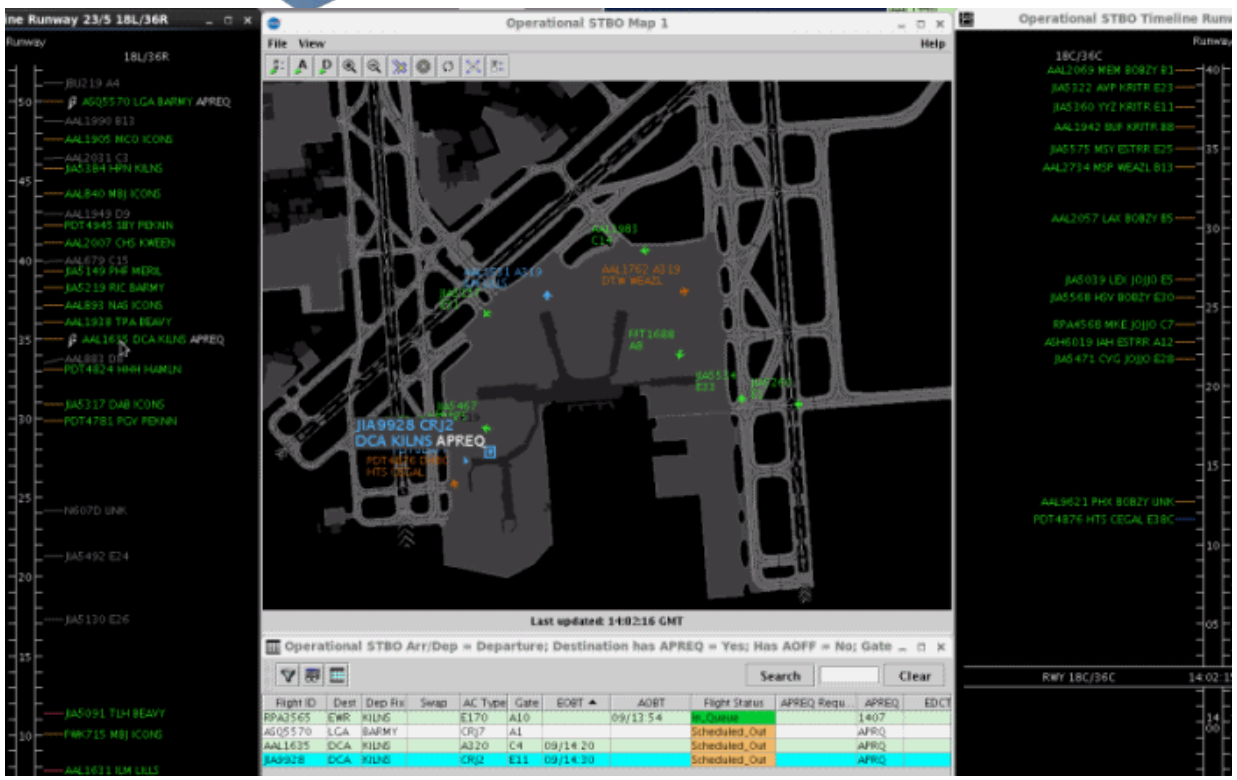


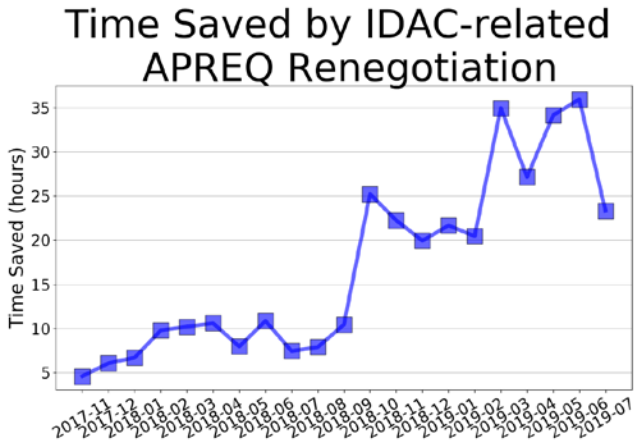
Saved approximately 4,161,962 lbs of CO2, equivalent to planting 30,948* urban trees

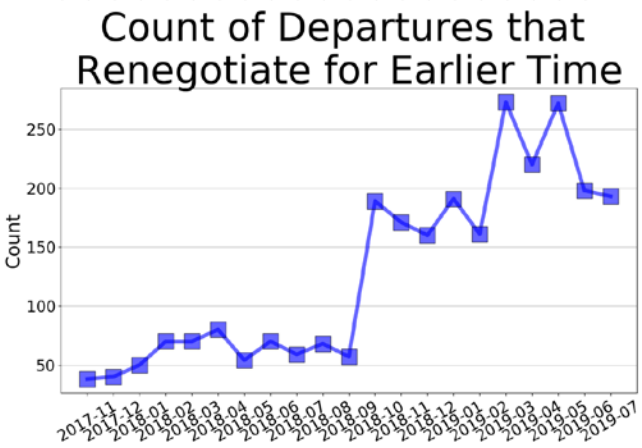
* Based on the updated equivalency factor (0.061 metric tons CO_2 per urban tree planted)

Overhead Stream Operational Integration Benefits 2017-11-01 through 2019-07-31

357.4 hours of delay saved by electronically renegotiating a better overhead stream time for 2,684 flights. Benefit mechanism (2b).





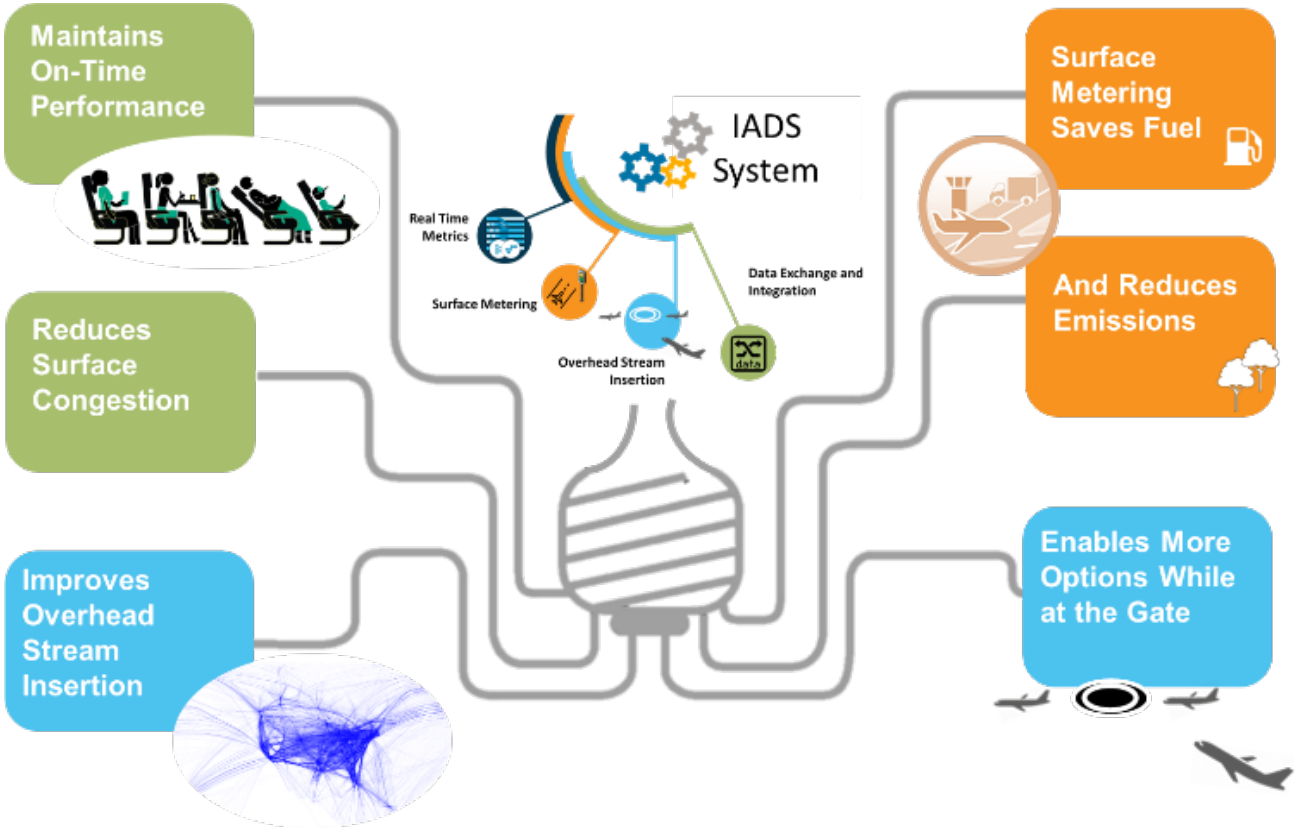


- The benefits described here are associated with better use of existing capacity in the overhead stream, and technology to reduce surface delay.
- These benefits are in addition to (distinct from) surface metering savings.

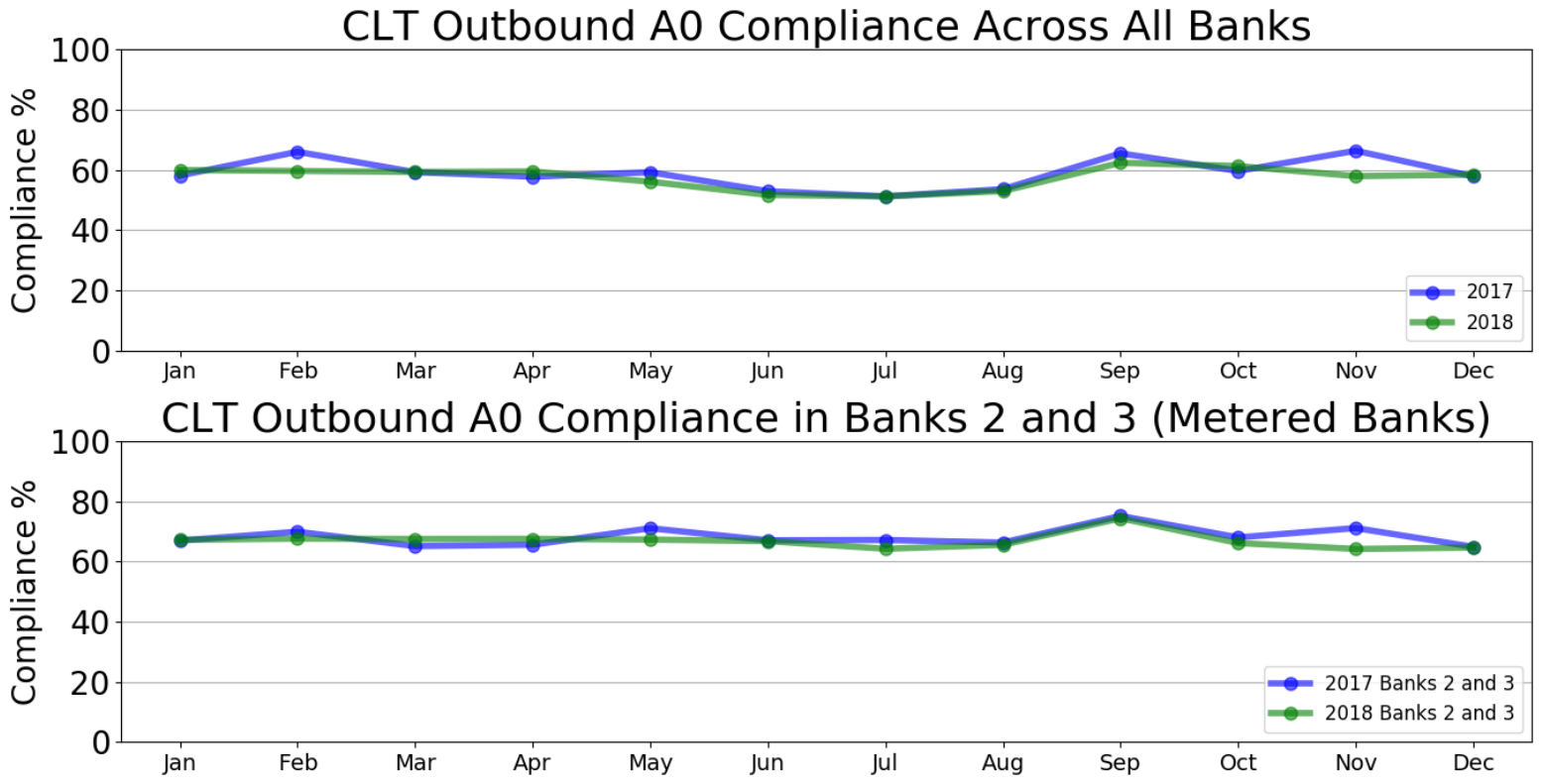
Demonstrating Benefits in the Field

- Multiple benefits mechanisms (2017-11-01 through 2019-07-31)
  - 2,755,166 lbs. of fuel saved
  - CO_2 savings equivalent to 63,101* urban trees
  - 357.4 hours of surface delay saved
    - $1,715,714 passenger value of time
    - $486,170 flight crew costs
  - 2,122 hours of reduced runtime on engines

* Based on the updated equivalency factor (0.061 metric tons CO_2 per urban tree planted)

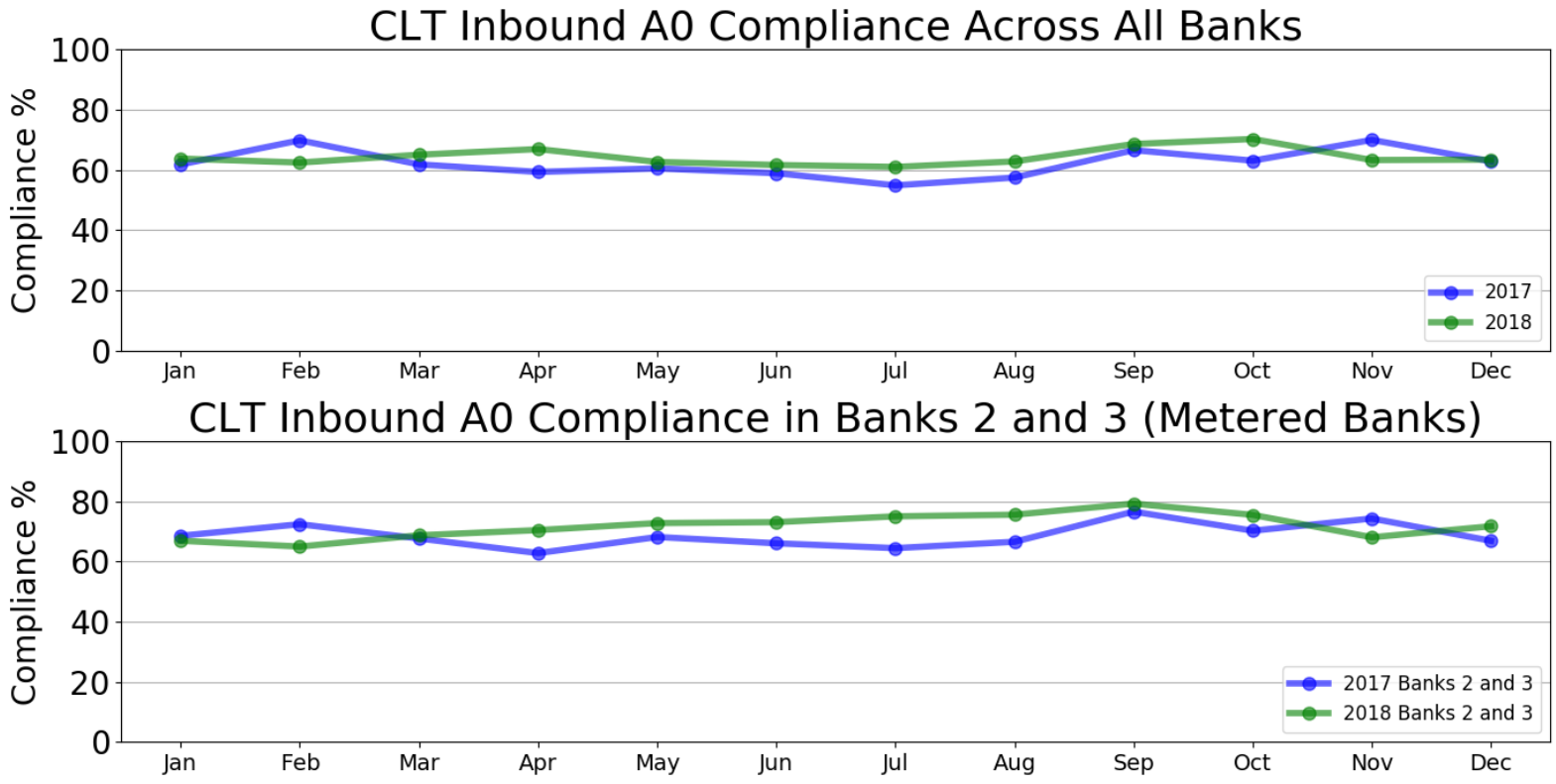


Outbound A0 On Time Performance



	2017 Compliance	2018 Compliance	YoY Change
Across All Banks	58.8%	57.5%	-1.3%
Banks 2 & 3	68.1%	66.8%	-1.3%

Inbound A0 On Time Performance



	2017 Compliance	2018 Compliance	YoY Change
Across All Banks	62.1%	64.4%	+2.3%
Banks 2 & 3	68.6%	71.9%	+3.3%

Benefits of surface departure metering while ’doing no harm’ to other operational metrics

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