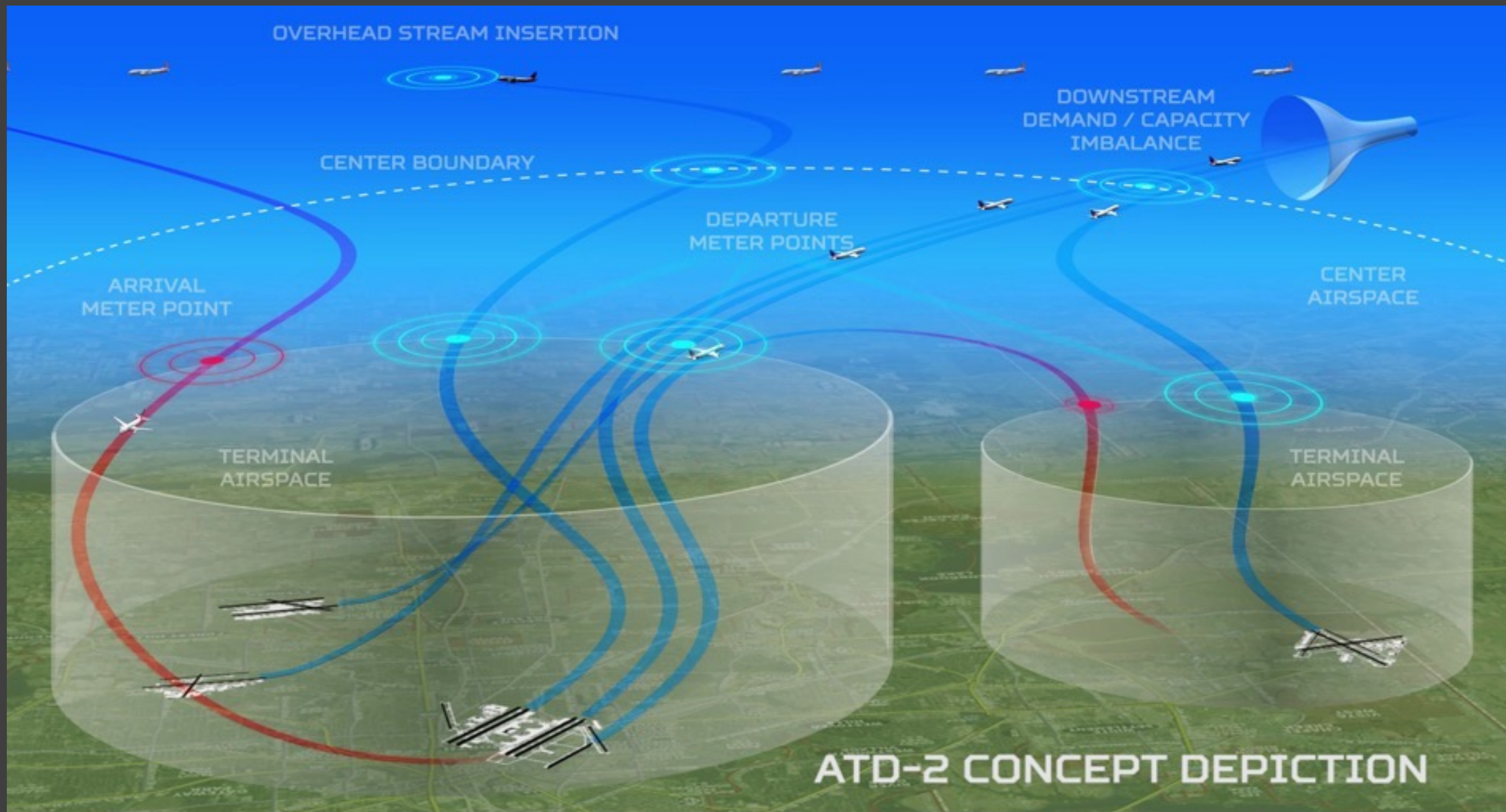




NASA ATD-2 Site Implementation Lead

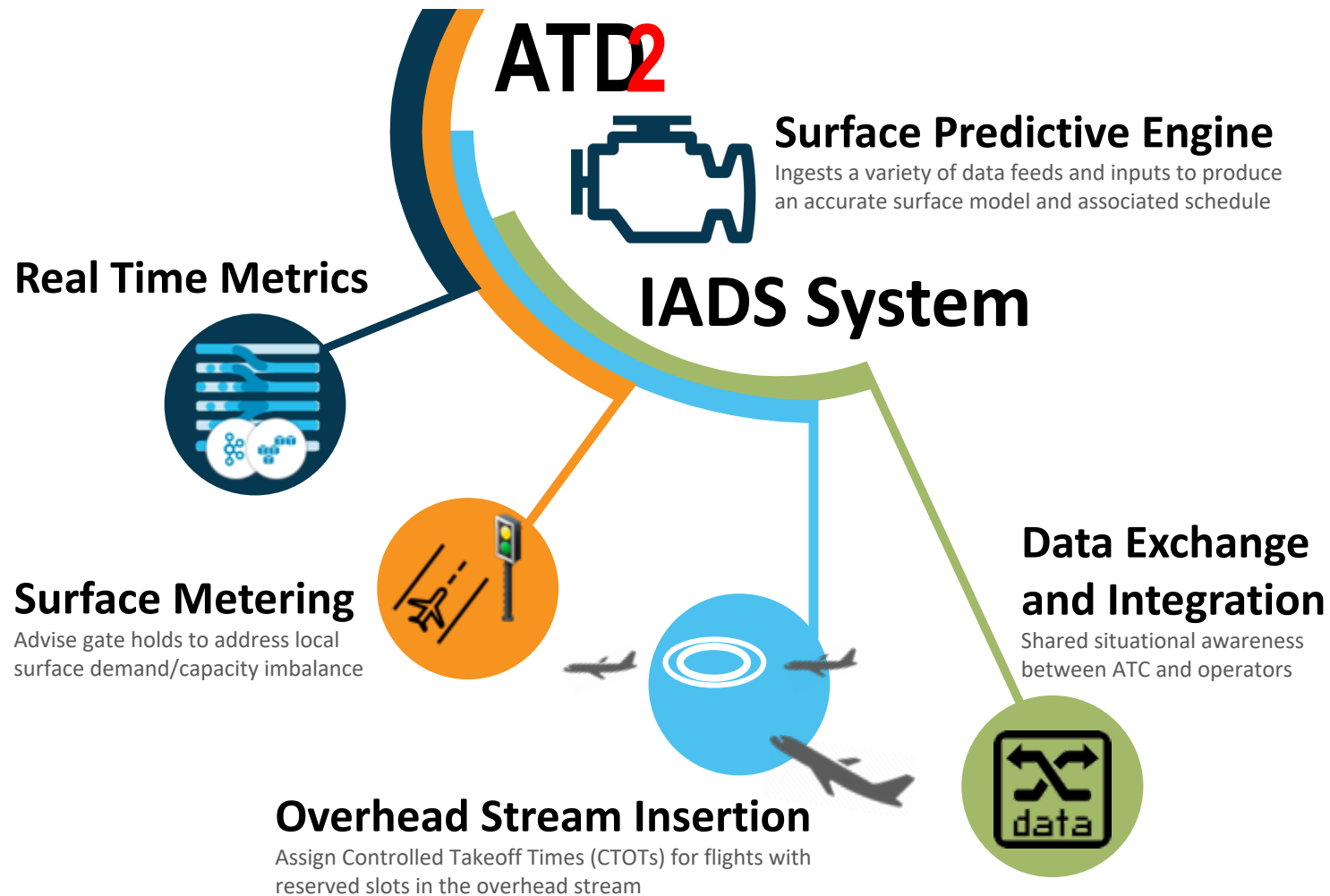
Shivanjli Sharma





ATD-2 IADS System Overview

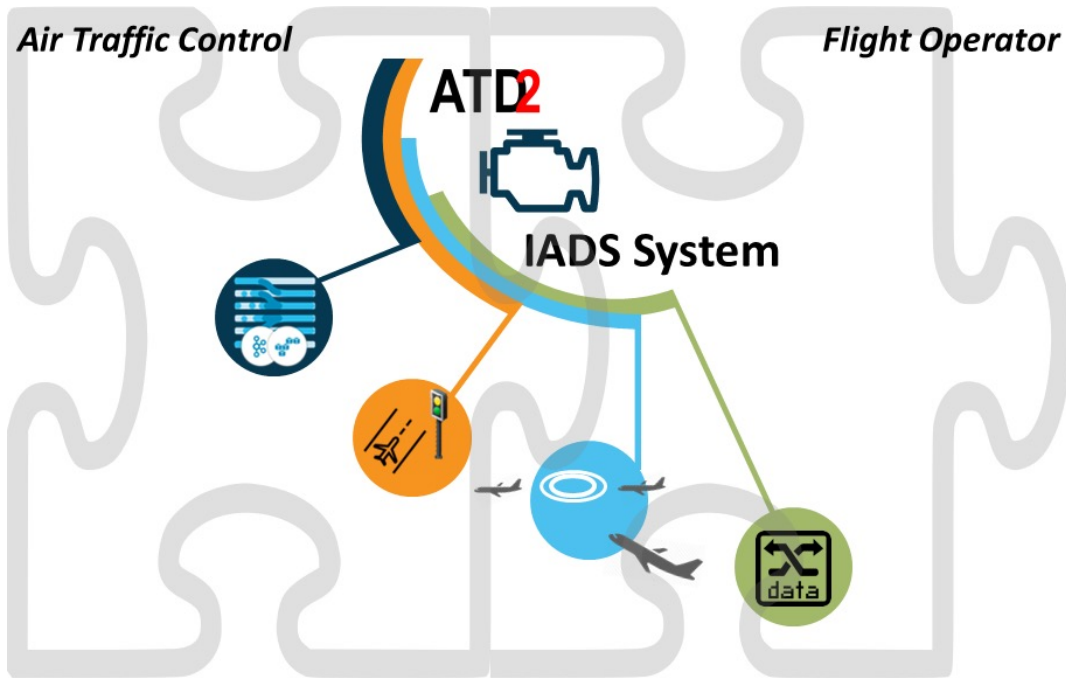
An integrated arrival/departure/surface (IADS) prediction, scheduling and management system that is “a trailblazer for the FAA's Terminal Flight Data Manager program”[†] and exploring concepts beyond TFDM’s scope.



[†] See https://www.faa.gov/nextgen/how_nextgen_works/ → Key Enabling Programs → Decision Support System (DSS) Automation → IADS



ATD-2 Phase 2: Single-Airport IADS at Charlotte (CLT)



ATD-2 and TFDM

NASA's ATD-2 Single-Airport IADS demo is a **trailblazer** for the FAA's Terminal Flight Data Manager (TFDM) Program

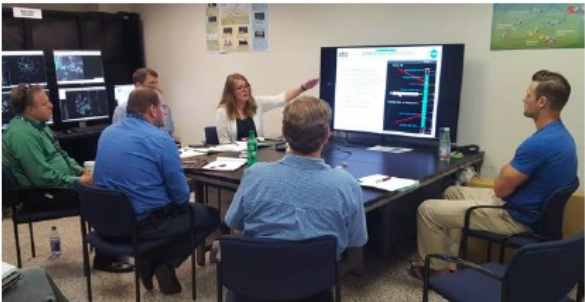
- The TFDM concept depends on unprecedented levels of collaboration between ATC and Operators
- TFDM will provide tools for ATC, but only data for Operators
- The ATD-2 IADS system implements **both** ATC and Operator **pieces of the puzzle**
- ATD-2 is transferring Technology and Knowledge to **both** FAA and Industry (operators and vendors)

Approach

- Developed a single-airport IADS system featuring a novel tactical scheduler for use by Operators and ATC at a major hub airport (CLT) and associated en route control facilities – Washington Center (ZDC) and Atlanta Center (ZTL)
- Integrated the NASA IADS system with operational FAA systems at CLT (AEFS) and ZDC and ZTL (TBFM)
- Demonstrated feasibility and benefits of IADS and TFDM concepts through 24 months (to date) of continuous field system use
- Transferred technology and knowledge to FAA and Industry (i.e. Operators and Solution Providers)



Agile Software Development Process Focused on Users



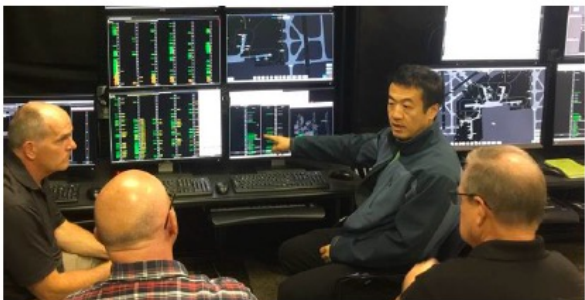
Shadow 1 Theme: predictive modeling, getting feedback, gaining confidence, acceptance



Shadow 2 Theme: Introduce large group of AAL ramp controllers to IADS tools and concept



Shadow 3 Theme: Data exchange and integration among all field demo partners



Shadow 4 Theme: TBFM/IADS integration, where IADS is a stand-in for TFDM



Shadow 5 Theme: Data analysis and DASH introduced



Shadow 6 Theme: Introduction of tactical surface metering concept



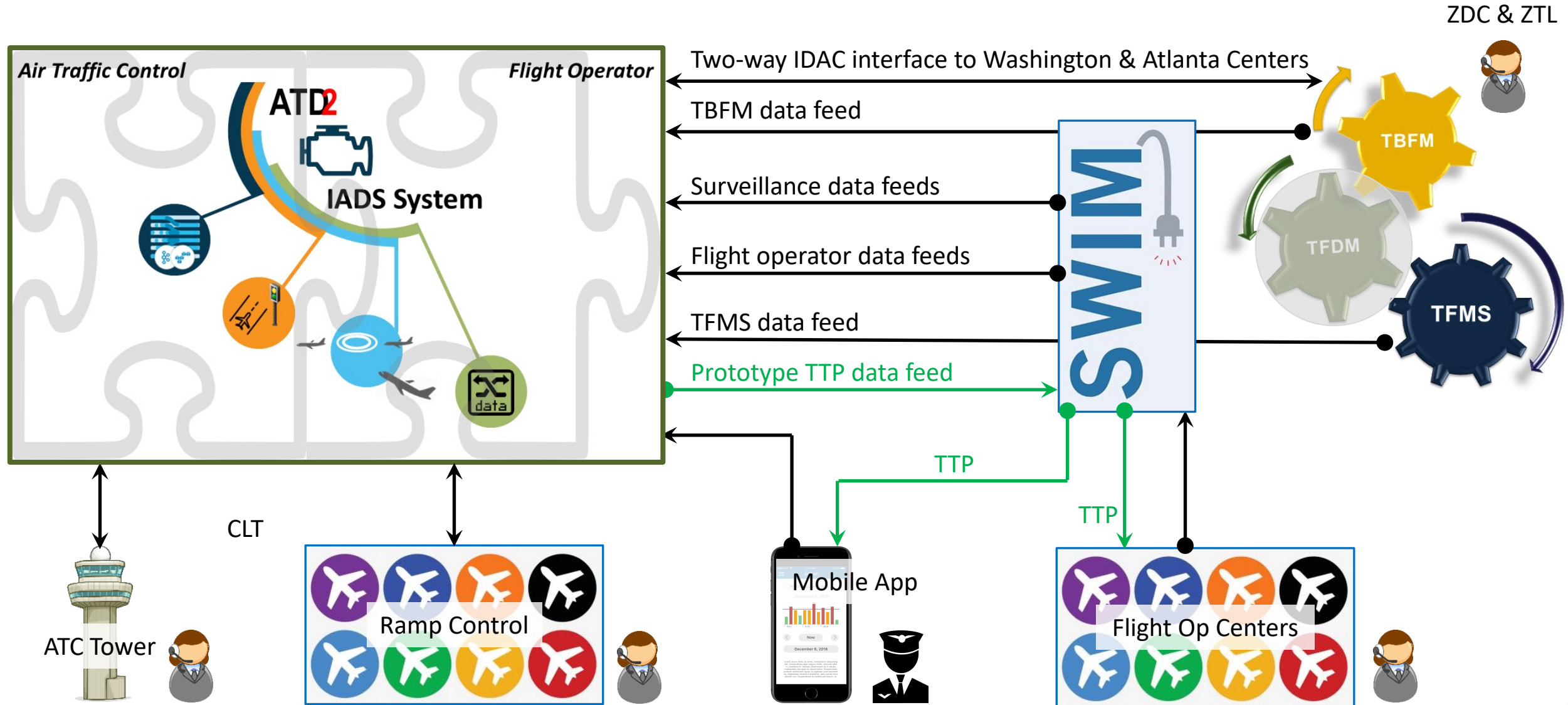
Shadow 7 Theme: Introduce IADS to the pilot community





ATD-2 Integration – Data and User Interfaces

TFDM is currently under development. The ATD-2 IADS system at CLT is a trailblazer for TFDM.

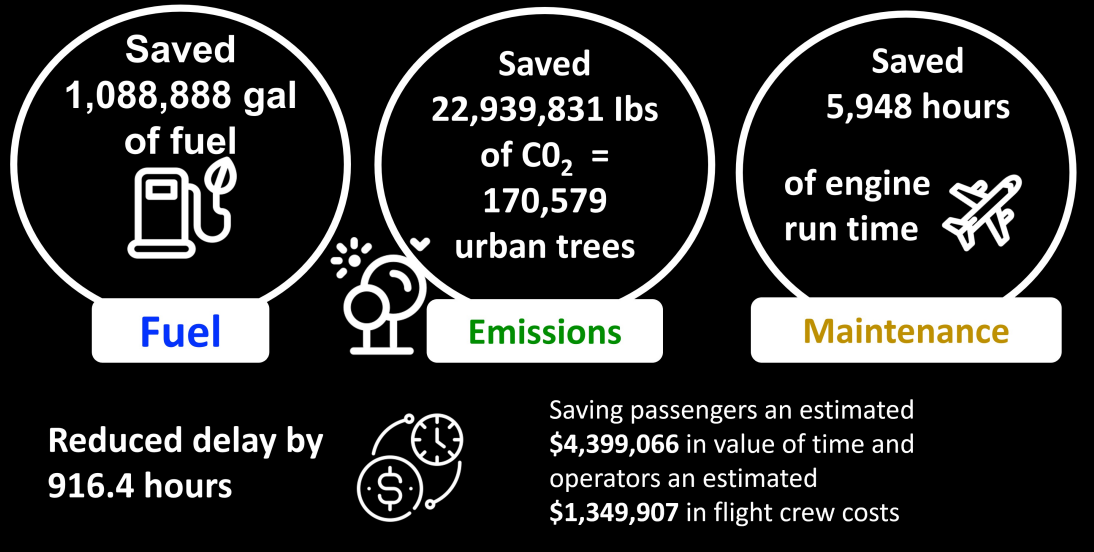




ATD-2 Impacts – Phase 1 & 2 Benefits at Charlotte (CLT)

Demonstrated Benefits

Benefits totals from Phases 1 & 2 of the ATD-2 field demonstration at Charlotte Douglas International Airport (29 Sep 2017 – 31 Aug 2021)



Primary Benefits Mechanisms

1. Surface metering

- Reduced engine run time
- Reduced fuel consumption and emissions

2. Overhead stream insertion

- a. Pre-scheduling controlled flights at the gate
 - Reduced engine run time
 - Reduced fuel consumption and emissions
- b. Electronic renegotiation 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 prior to pushback

Benefit (2b) achieved through electronic renegotiation after pushback

- Electronic renegotiation involves using ATD-2 to request an earlier release time from TBFM for controlled flights
- Electronic renegotiation for 5,332 flights yielding 704.5 hours of direct delay savings