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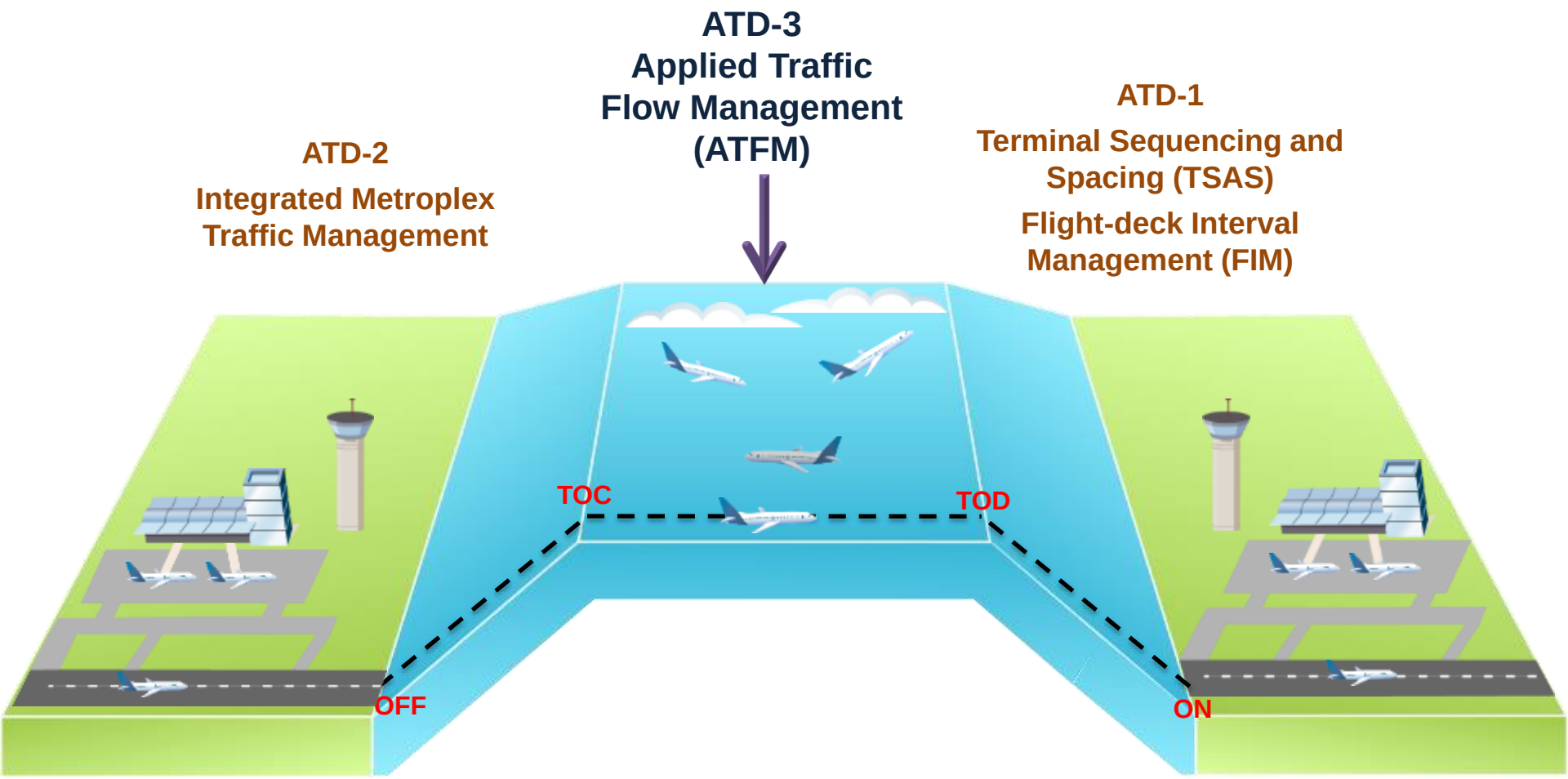
Airspace Technology Demonstration 3 (ATD-3): Applied Traffic Flow Management

Project Overview

August 31, 2016

Chester Gong
NASA Ames Research Center

ATD-3 Scope



TOC - Top of Climb
TOD - Top of Descent

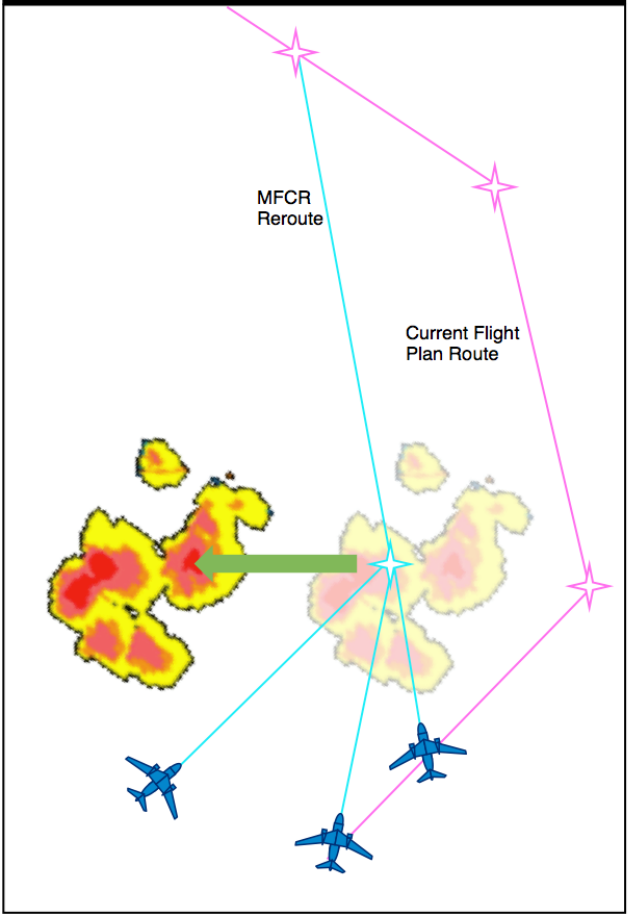
ATD-3 Technical Challenge

Reduce weather-induced delays through integration of weather information to better manage aircraft, traffic flow, airspace and schedule constraints by delivering air/ground procedures and user-tool technologies.

ATD-3 Technologies

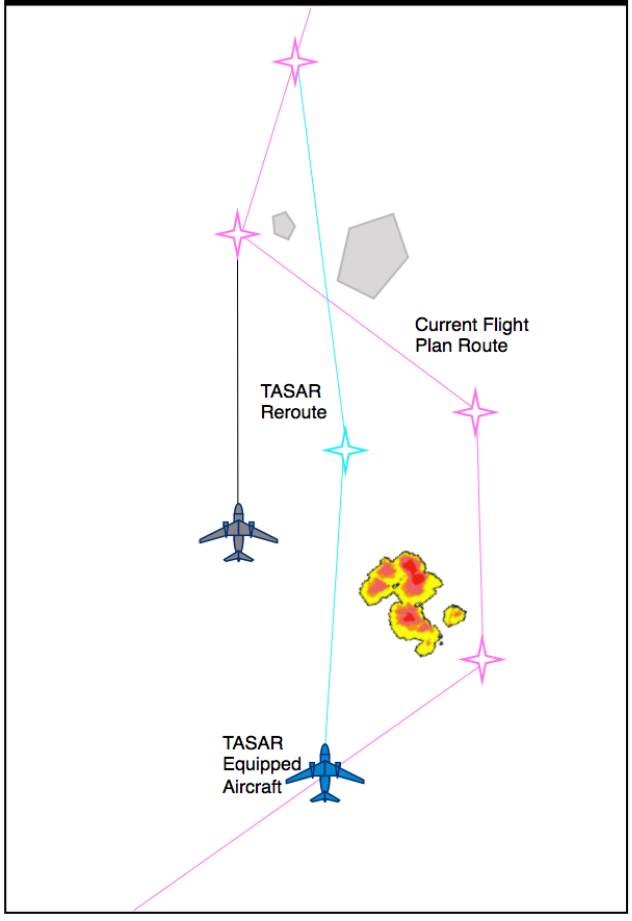
Multi-Flight Common Route (MFCR):

Automated search for efficient high value reroutes for individual flights and common reroutes for multiple flights - delay recovery from stale TMIs.



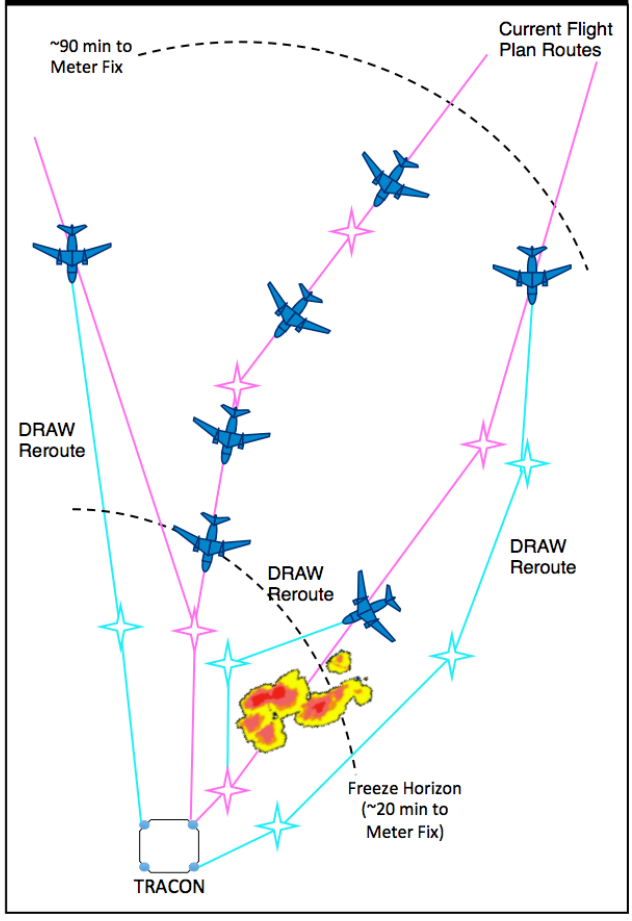
Traffic Aware Strategic Aircrew Requests (TASAR):

Airborne automated continuous searching for efficient reroutes that reduce fuel and/or flight time, avoid interactions with traffic, weather and restricted airspace.

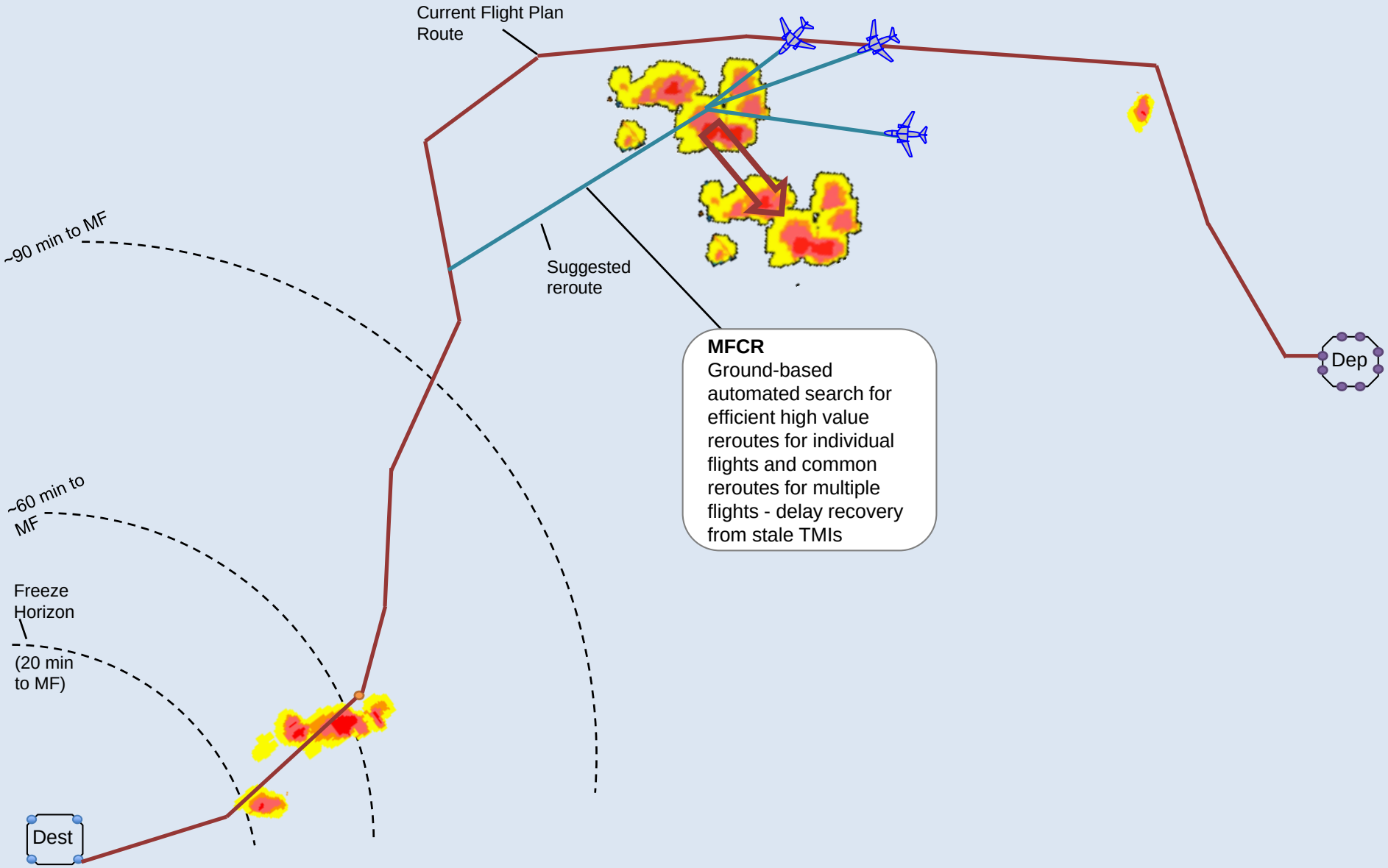


Dynamic Routes for Arrivals in Weather (DRAW):

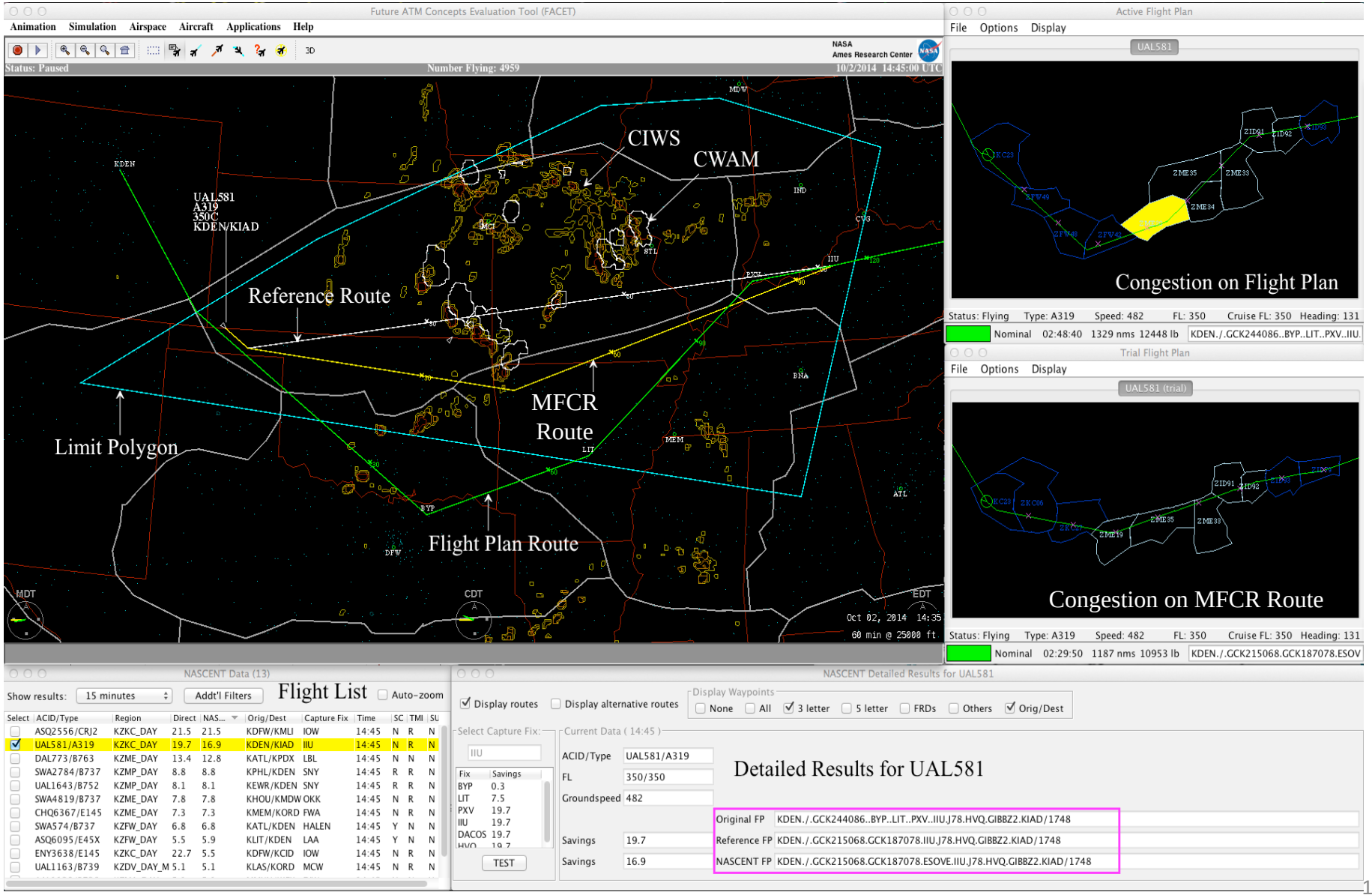
Efficient reroutes to maintain metering operations in the presence of weather, find efficient arrival routes, and balance meter fix demand.



ATD-3 Integrated Concept

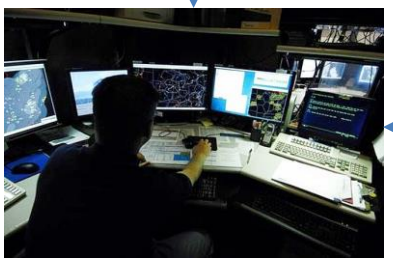


MFCR User Interface

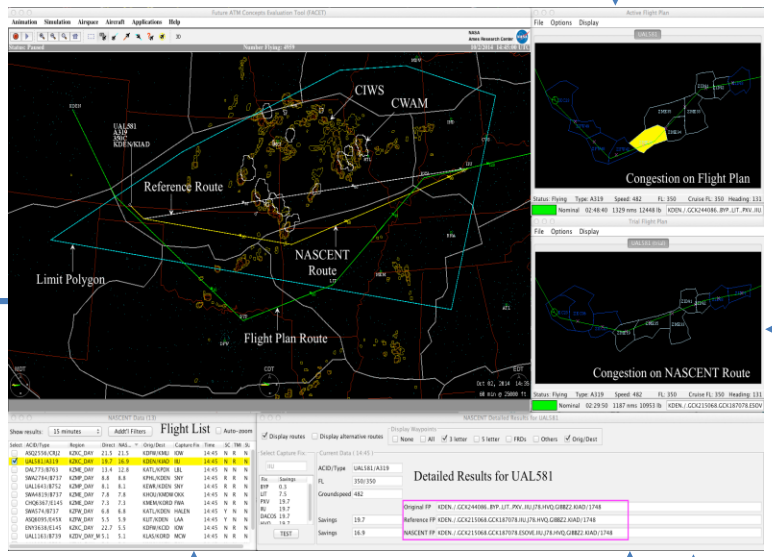


MFCR Architecture Diagram

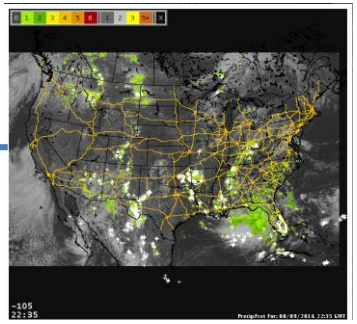
Dispatch or
Traffic Management Coordinator



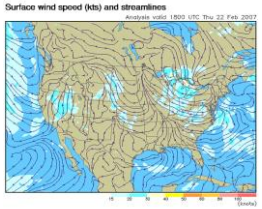
AOC or ARTCC



MFCR

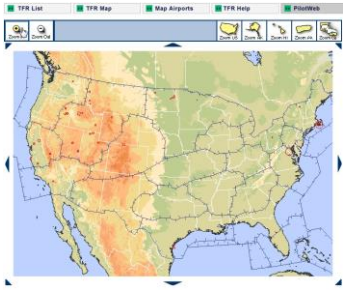


CIWS



Rapid Refresh Wind Model (NOAA)

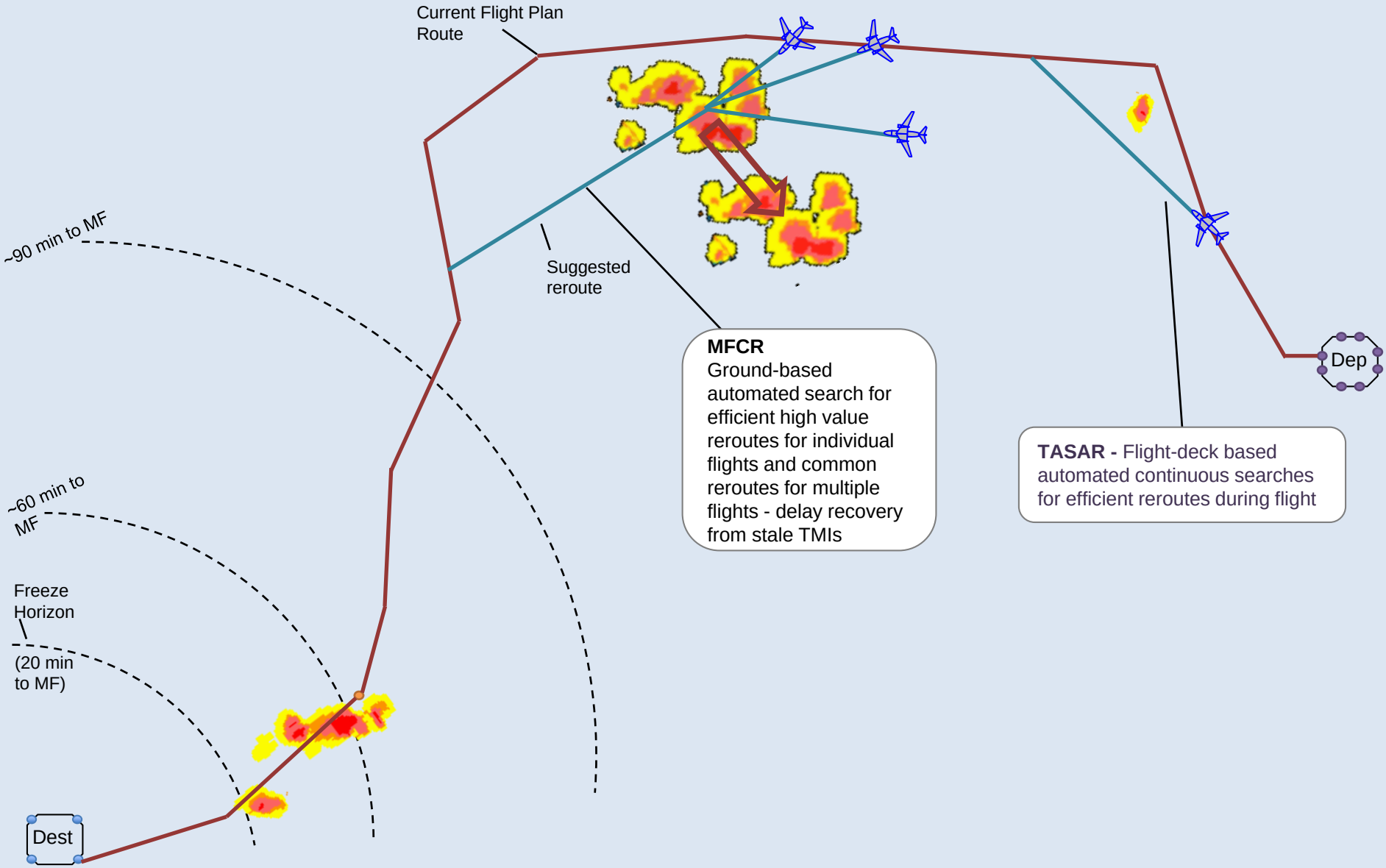
TFM Data (via SWIM)



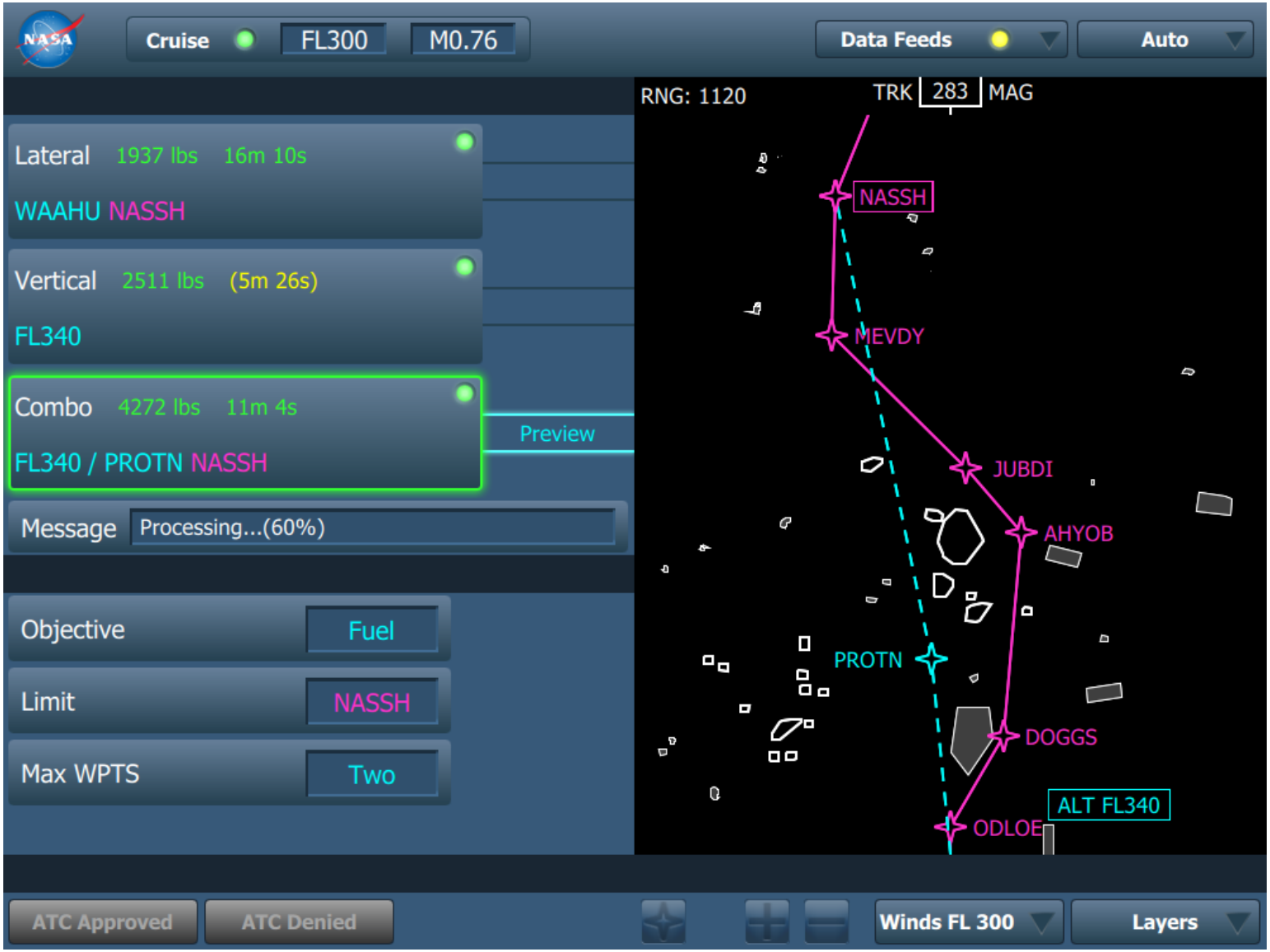
TFR System (FAA)

SUA System (FAA)

ATD-3 Integrated Concept

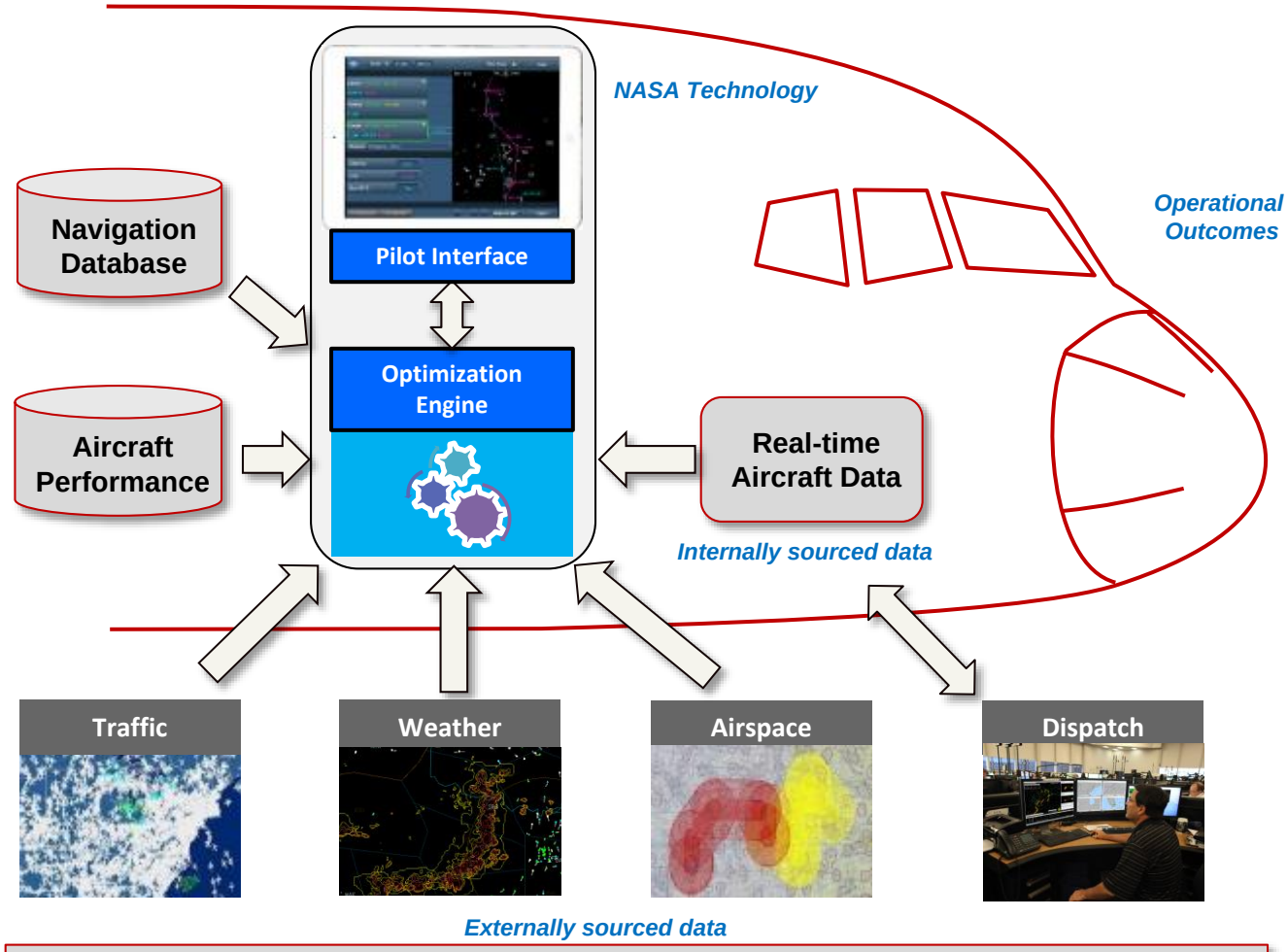


TASAR User Interface



Traffic Aware Strategic Aircrew Requests (TASAR)

Pilot uses onboard automation tool to optimize an aircraft's trajectory



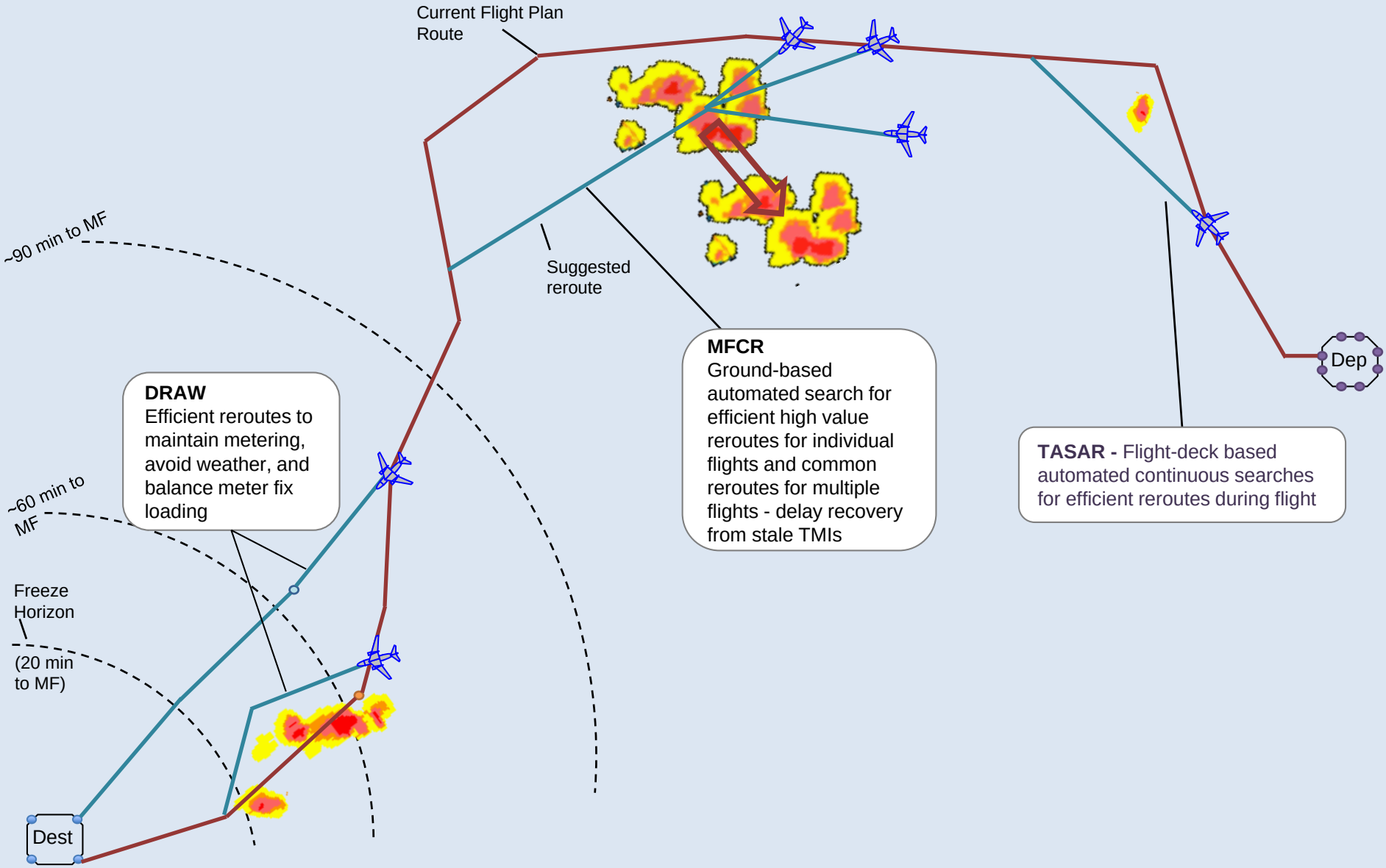
Tool leverages networked connectivity to real-time operational data

Greater flight efficiency en route

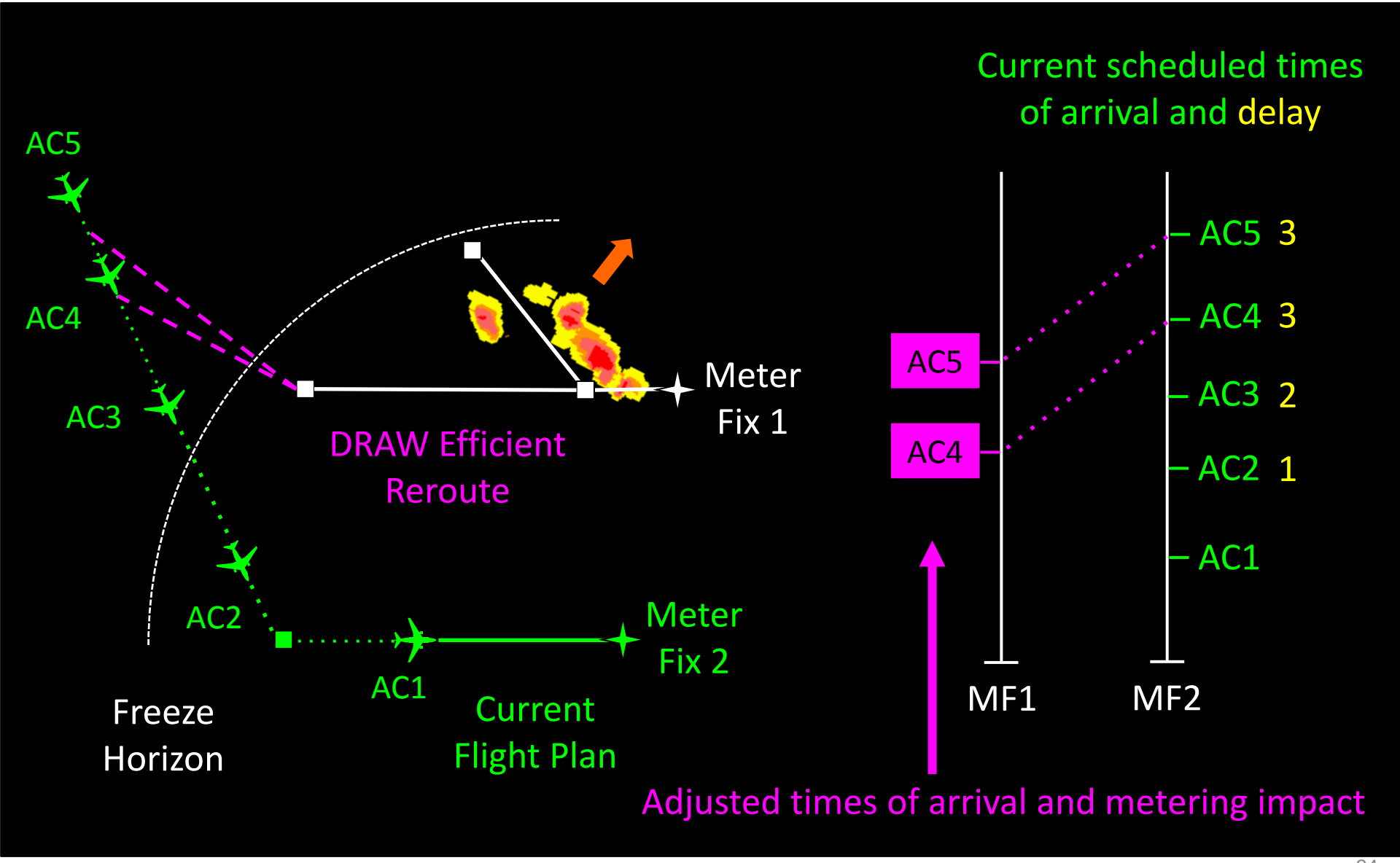
Crew Request ⇕ ATC Response

Increased ATC approval of requests

ATD-3 Integrated Concept

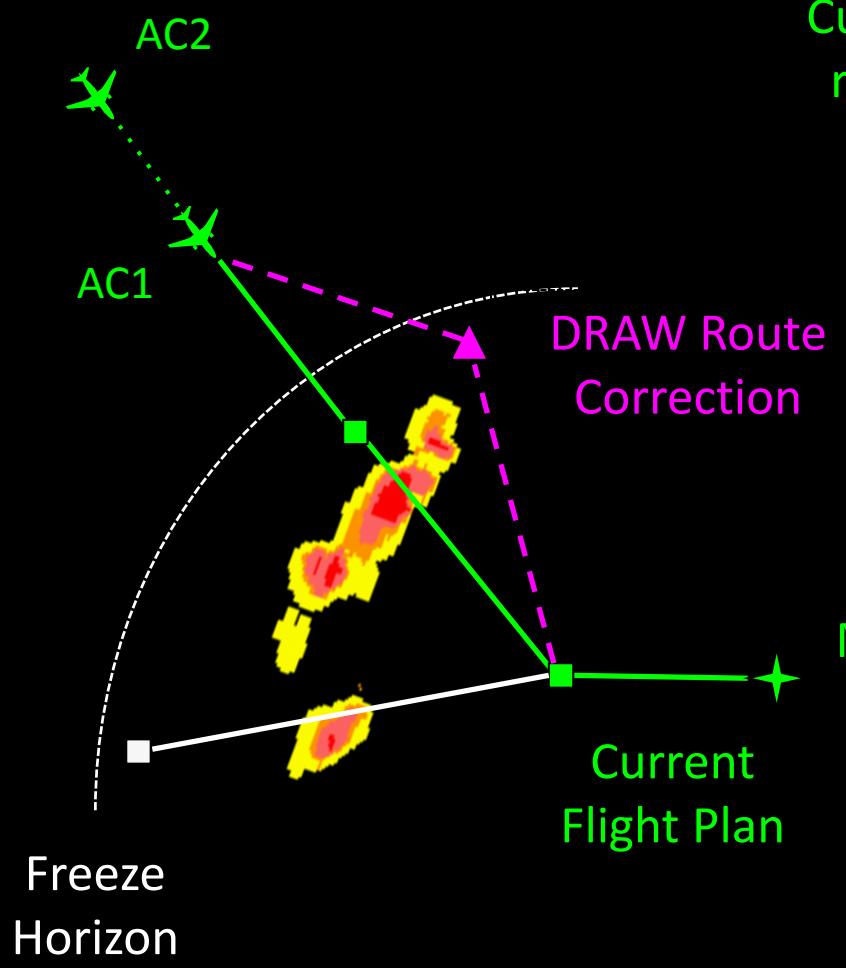


DRAW – Time-Saving Reroutes to Alternate Meter Fix

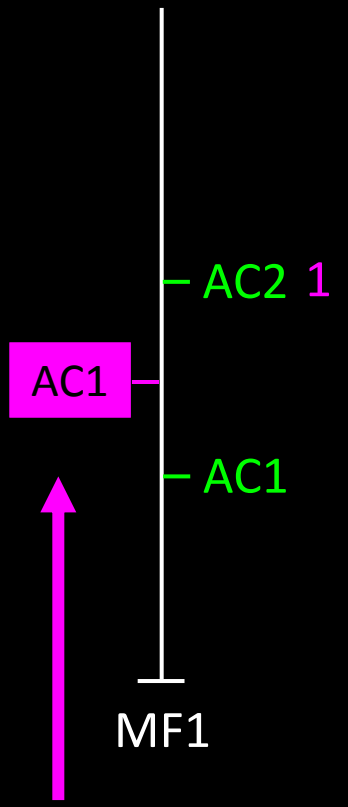


DRAW - Route Correction to Avoid Weather & Maintain Accurate Schedule Time of Arrival

Applied Traffic Flow Management



Current scheduled times of arrival do not reflect the need to deviate for weather

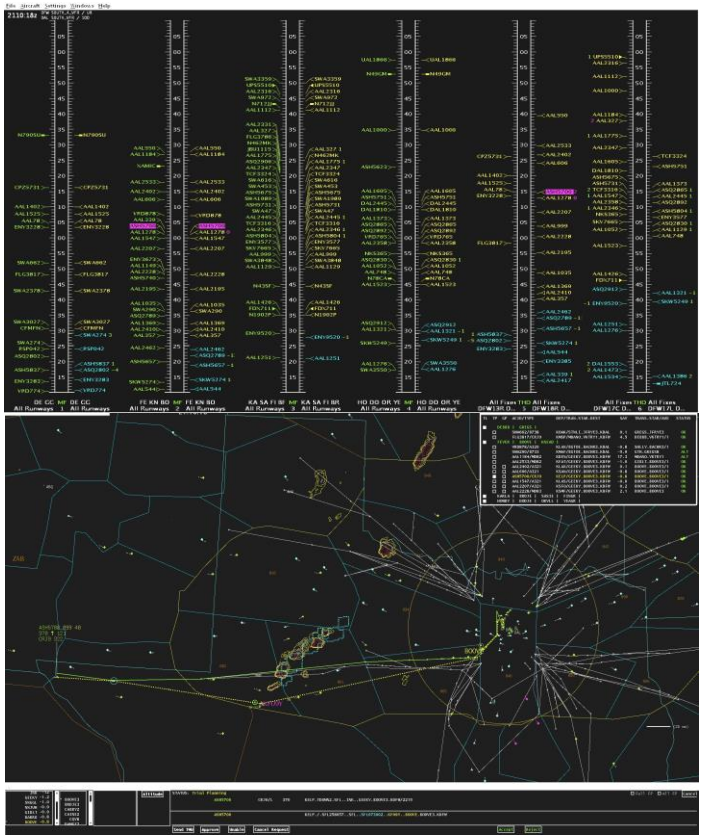


Adjusted time of arrival and delay

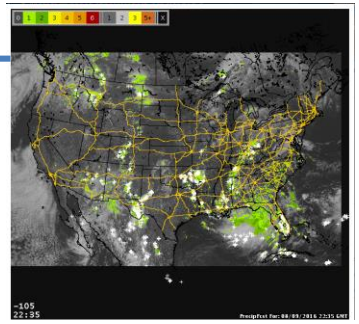
DRAW Architecture Diagram

Traffic Management Coordinator
In ARTCC

Traffic Management Unit
In ARTCC



DRAW

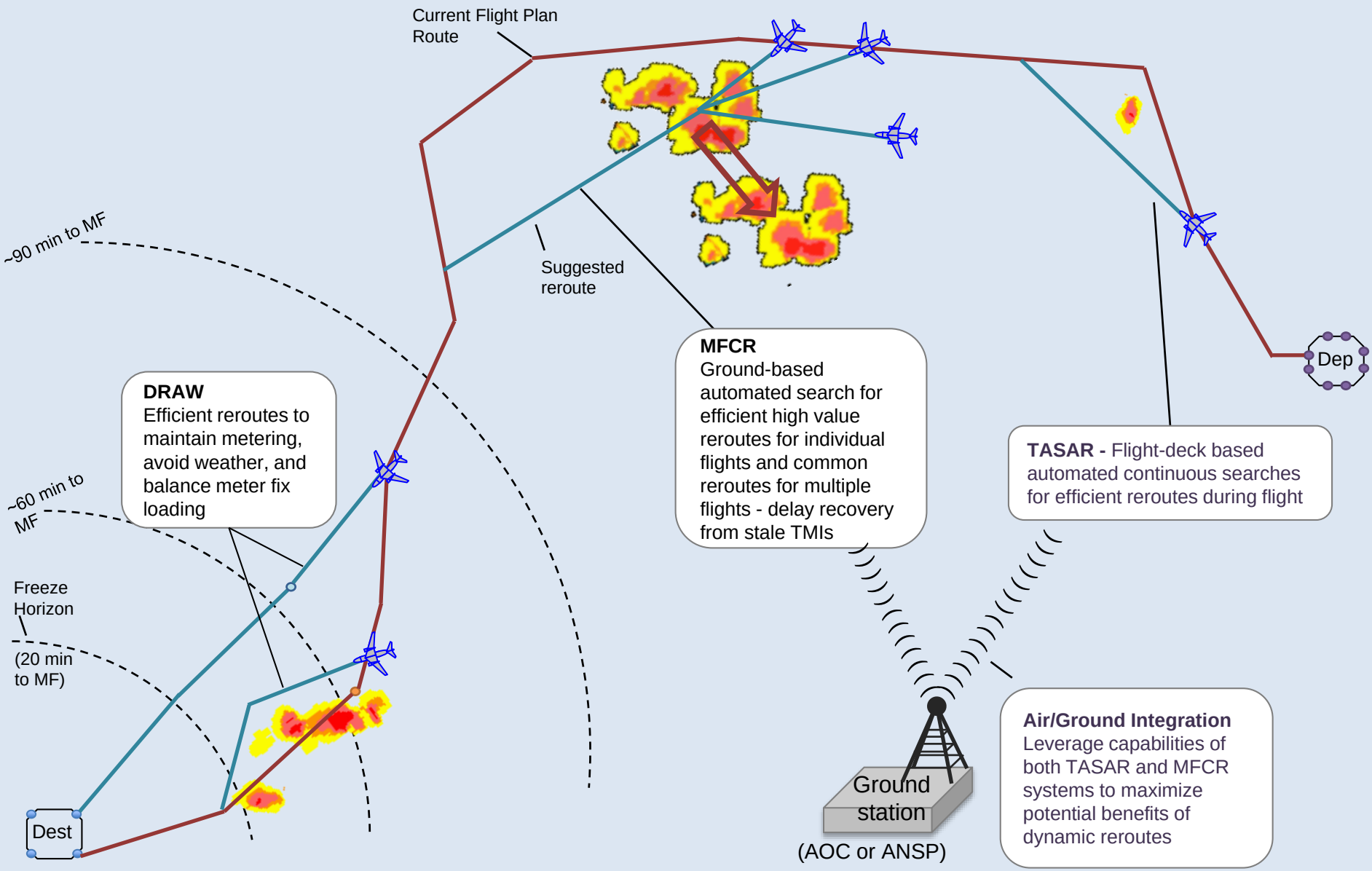


CIWS

Rapid Refresh Wind Model (NOAA)

ERAM

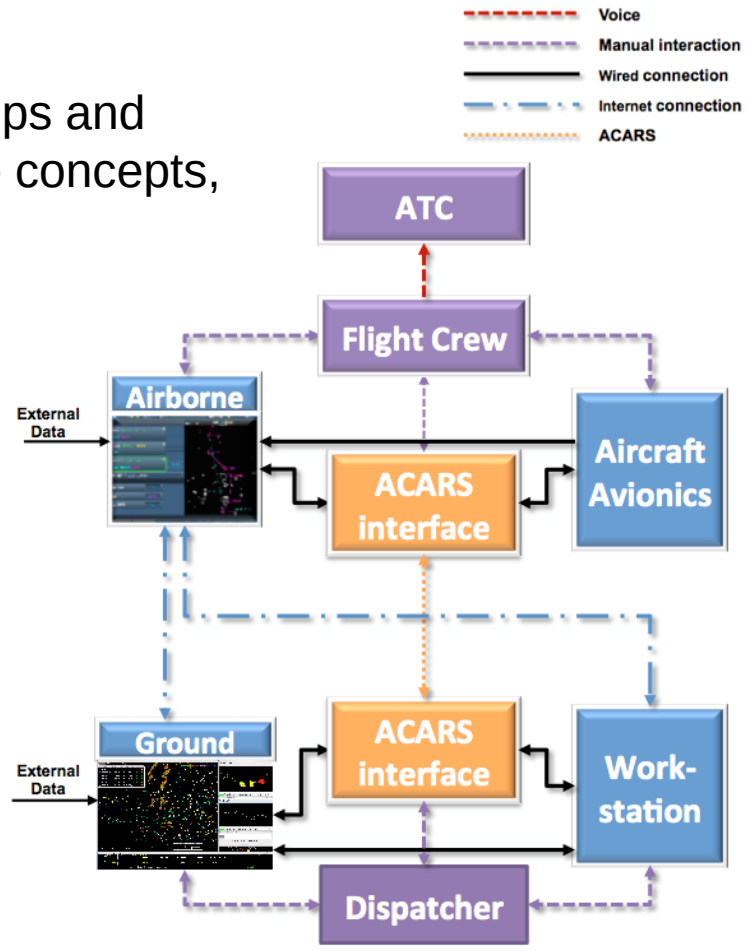
ATD-3 Integrated Concept



Air/Ground Integration

Plan through Q2FY17

- Qualitative benefit assessment of candidate air/ground concepts
- Leveraging existing airline and FAA partnerships and agreements, solicit feedback on top candidate concepts, establish demonstration partnership(s)
- Develop Objectives, initial ConOps, and top-level requirements for air/ground concept and demonstration
- Complete Air/Ground Integration Plan through FY20 leading to demonstration



DRAW System Demonstration