Aeronautical Information Services

AAtS Demonstration: Lessons Learned

Presented to: ATIEC

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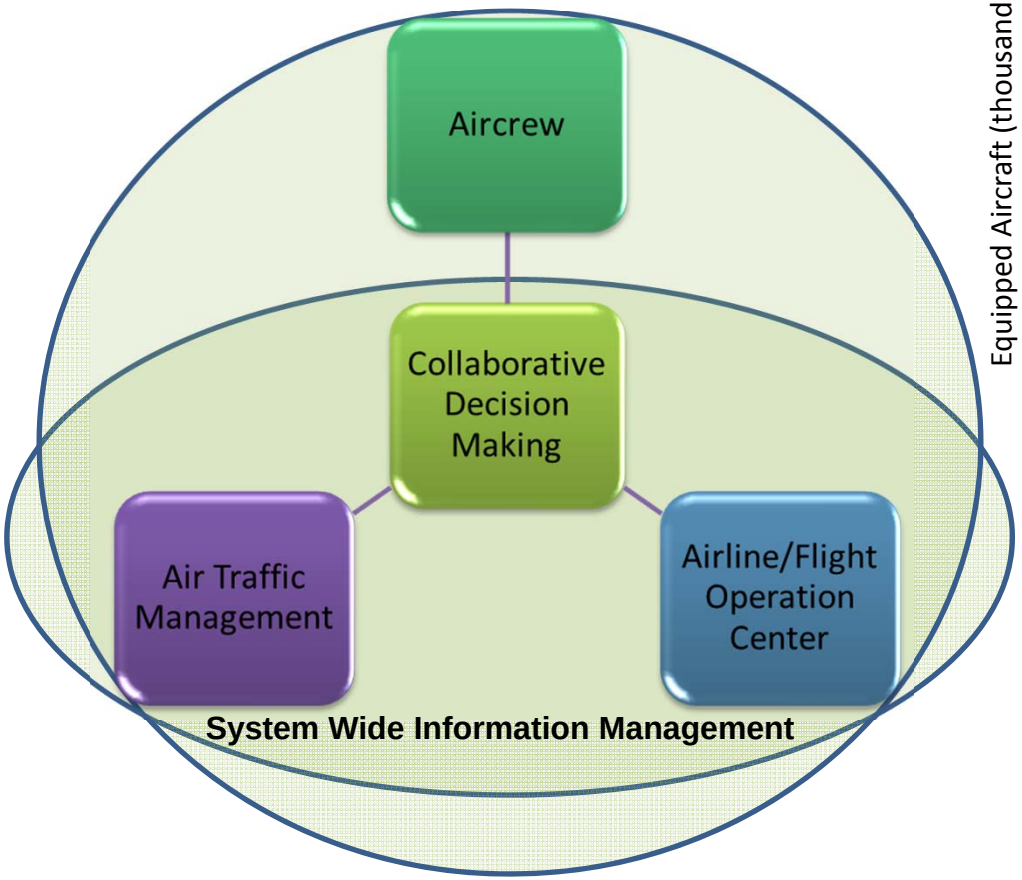
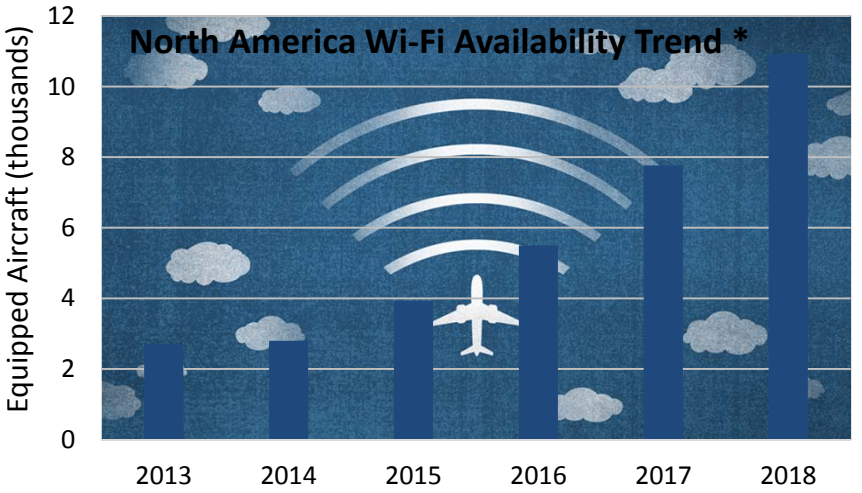
Aviation Information World – Forecasting the Future

Collaborative Decision Making



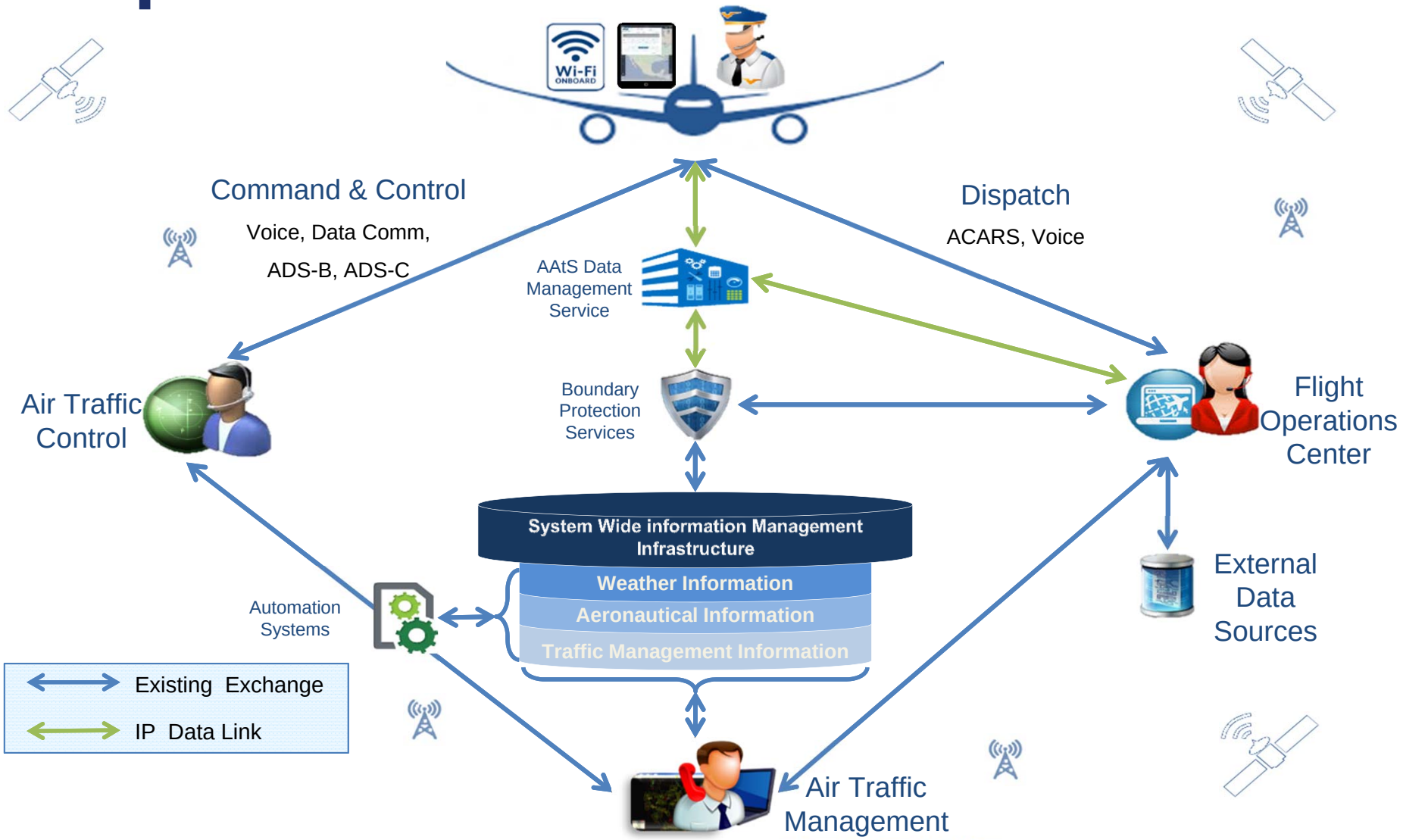


[* http://www.ipass.com/wifi-growth-map/](http://www.ipass.com/wifi-growth-map/)

Aircraft Access to SWIM

- Technology agnostic solution that demonstrates airborne application of ground based System Wide Information Management (SWIM) Service Oriented Architecture (SOA)
- Facilitates exchange of non-command and control/safety critical information between pilots and other National Airspace System (NAS) users
- Facilitates a commonly sourced/shared aviation information environment for strategic collaborative decision making
- Leverages existing air/ground third party service providers' infrastructure and technologies without new equipage mandates

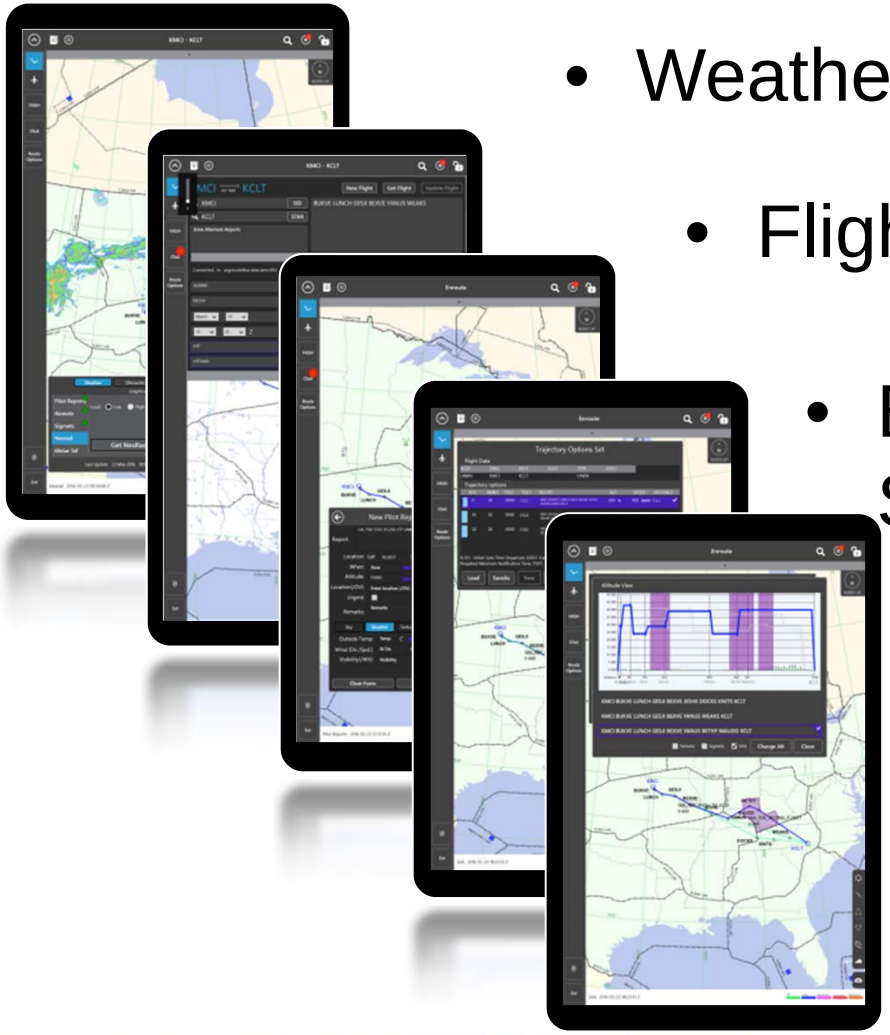
Operational Overview



Demonstration Objectives

- Assess feasibility of commercial services for exchanging SWIM-enabled NAS data
- Provide technical findings and recommendations for future standards development
- Validate concept in cooperation with NAS users/stakeholders

Demonstration Scenarios



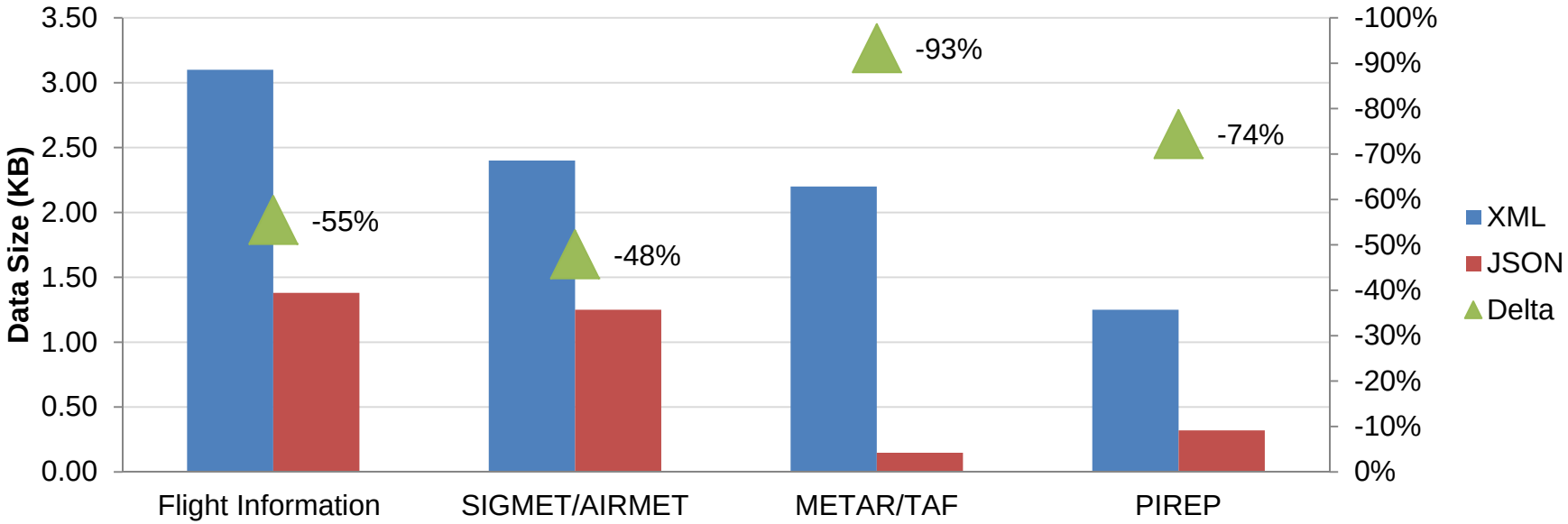
- Weather Information
  - Flight Information Update
    - Electronic PIREP Submission
      - Aircraft Preference Publication
        - Initial 4DT Preference Exchange

Key Lessons Learned

- Data Format and Sizes
- Flight Object Governance
- DMS standardization
- Data Link Configuration
- EFB connectivity
- EFB application Integration with AOC
- Human Factors

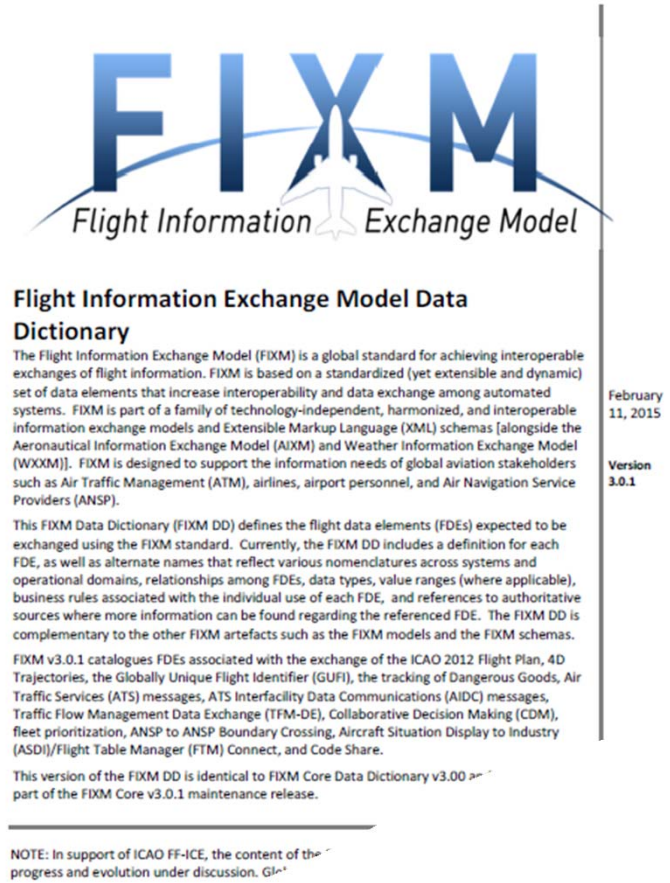
Data Format and Sizes

- Standardized data formats that are optimal for ground to ground exchange are not ideal for limited bandwidth connections available on aircraft
  - Filtering non applicable fields in AXIM / WXXM / FIXM
  - Use of Industry standards (e.g. JSON)



Flight Object Management

- Flight Object* includes large number of data fields
  - Aircraft Identification, type, airspeed, departure location, destination, route of flight, ETA, crew capabilities, aircraft capabilities, etc.
- Define what fields should be editable by whom during which phases of flight to support flight operations



FIXM
Flight Information Exchange Model

Flight Information Exchange Model Data Dictionary

The Flight Information Exchange Model (FIXM) is a global standard for achieving interoperable exchanges of flight information. FIXM is based on a standardized (yet extensible and dynamic) set of data elements that increase interoperability and data exchange among automated systems. FIXM is part of a family of technology-independent, harmonized, and interoperable information exchange models and Extensible Markup Language (XML) schemas [alongside the Aeronautical Information Exchange Model (AIXM) and Weather Information Exchange Model (WXXM)]. FIXM is designed to support the information needs of global aviation stakeholders such as Air Traffic Management (ATM), airlines, airport personnel, and Air Navigation Service Providers (ANSP).

This FIXM Data Dictionary (FIXM DD) defines the flight data elements (FDEs) expected to be exchanged using the FIXM standard. Currently, the FIXM DD includes a definition for each FDE, as well as alternate names that reflect various nomenclatures across systems and operational domains, relationships among FDEs, data types, value ranges (where applicable), business rules associated with the individual use of each FDE, and references to authoritative sources where more information can be found regarding the referenced FDE. The FIXM DD is complementary to the other FIXM artefacts such as the FIXM models and the FIXM schemas.

FIXM v3.0.1 catalogues FDEs associated with the exchange of the ICAO 2012 Flight Plan, 4D Trajectories, the Globally Unique Flight Identifier (GUFI), the tracking of Dangerous Goods, Air Traffic Services (ATS) messages, ATS Interfacility Data Communications (AIDC) messages, Traffic Flow Management Data Exchange (TFM-DE), Collaborative Decision Making (CDM), fleet prioritization, ANSP to ANSP Boundary Crossing, Aircraft Situation Display to Industry (ASDI)/Flight Table Manager (FTM) Connect, and Code Share.

This version of the FIXM DD is identical to FIXM Core Data Dictionary v3.00 a[illegible] part of the FIXM Core v3.0.1 maintenance release.

NOTE: In support of ICAO FF-ICE, the content of the[illegible] progress and evolution under discussion. Gl[illegible]

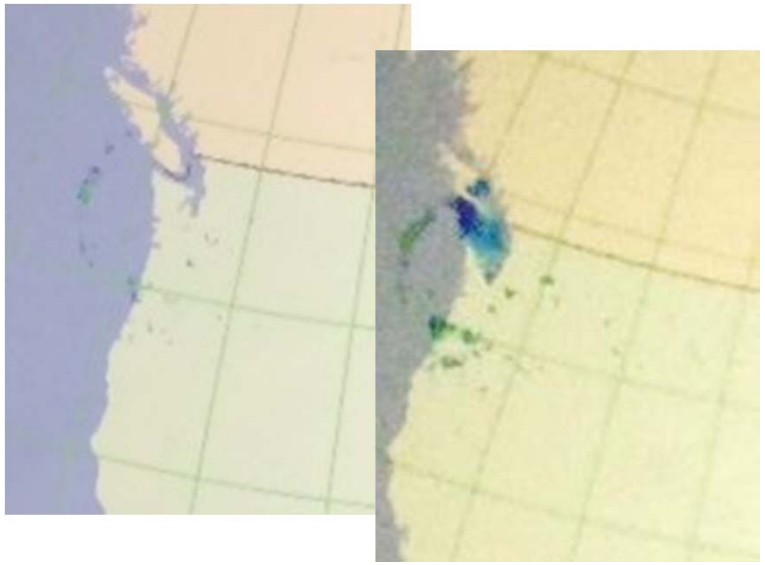
February 11, 2015

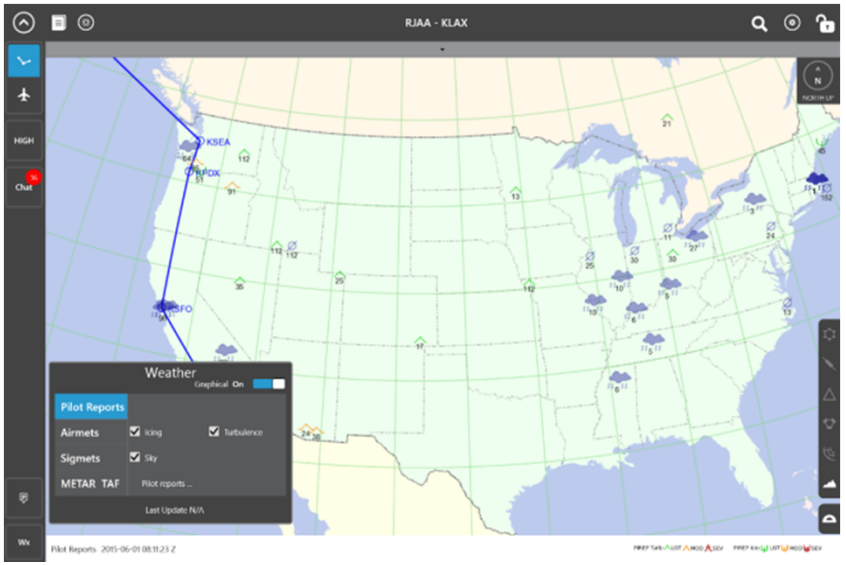
Version 3.0.1

*Flight Object is the aggregated collection of flight data and related information which supports the goal of improving system-to-system interoperability within the NAS and beyond

Data Management Service Standardization

- Standardization required to ensure consistent display of information among DMS providers
  - NEXRAD washout
  - Data validity (PIREP)



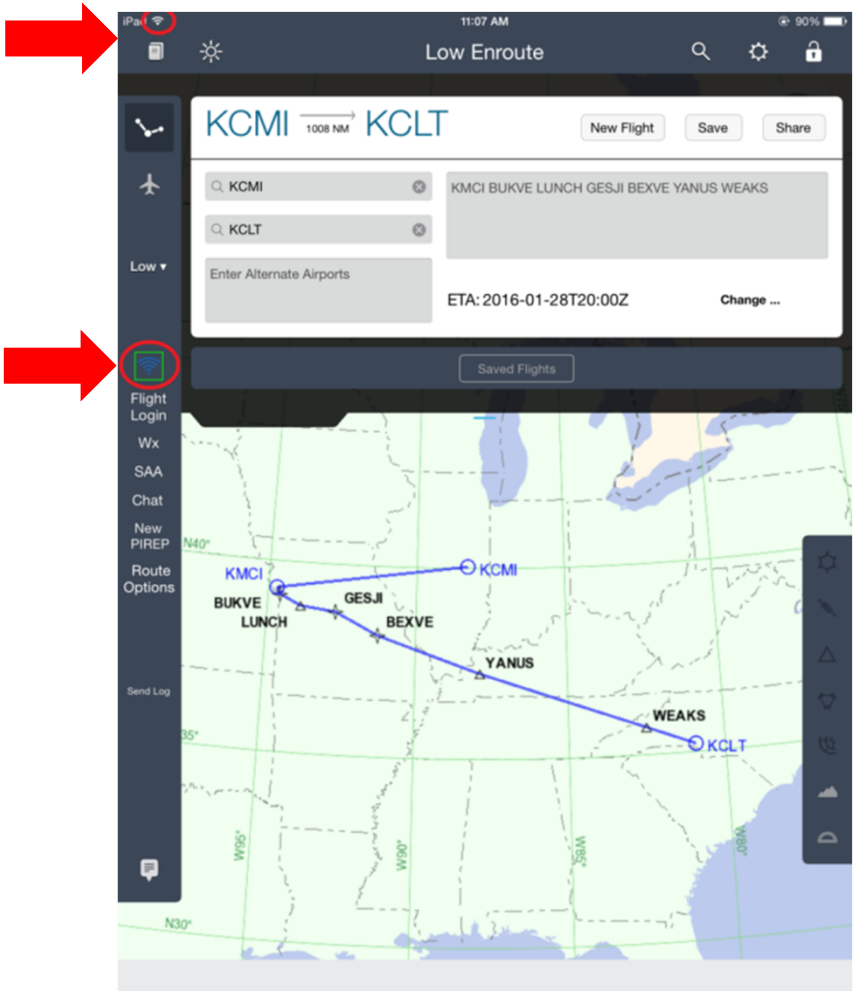


Data Link Configuration

- Implementation requires close coordination with data link provider to ensure reliable service
  - Intended use
  - Data encryption
  - Editing the packets sent/received by the EFB application
  - Dedicated link to flight deck
  - IP data link availability requirement

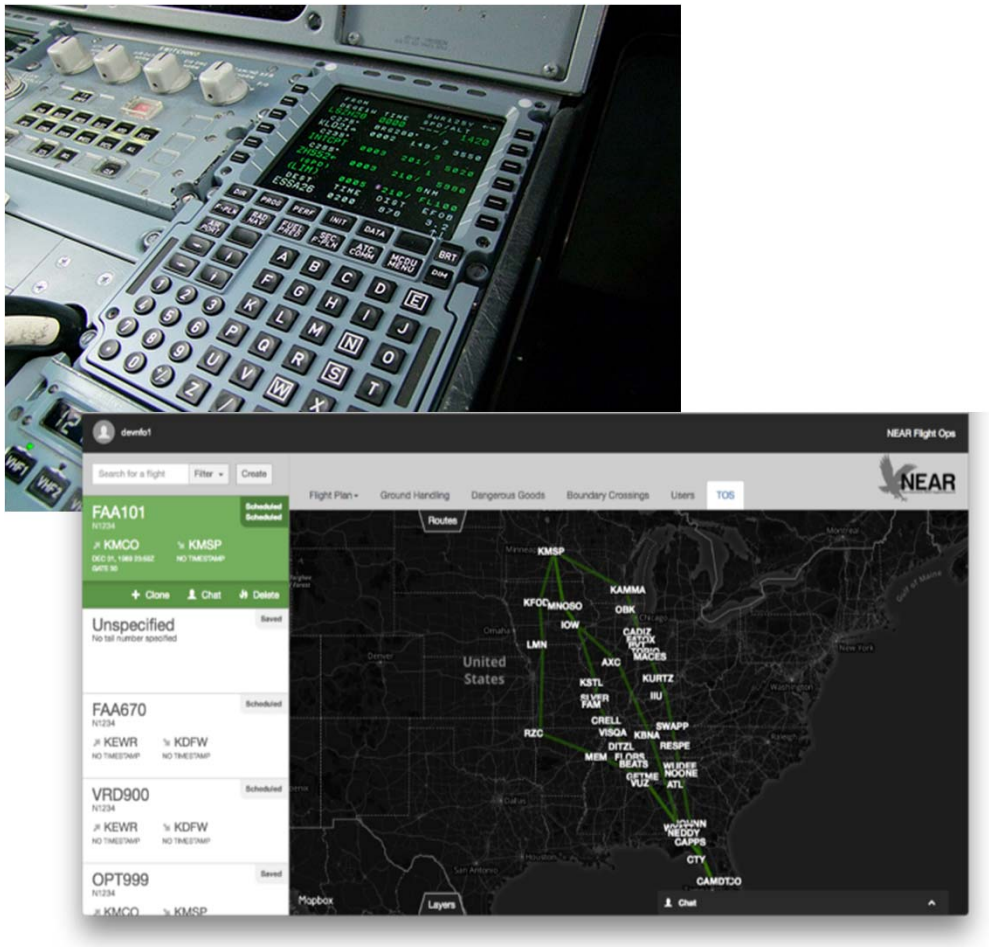
Connection Status Indication

- Connectivity status notification required to prevent false sense of situational awareness
  - Router
  - Internet
  - DMS
  - SWIM



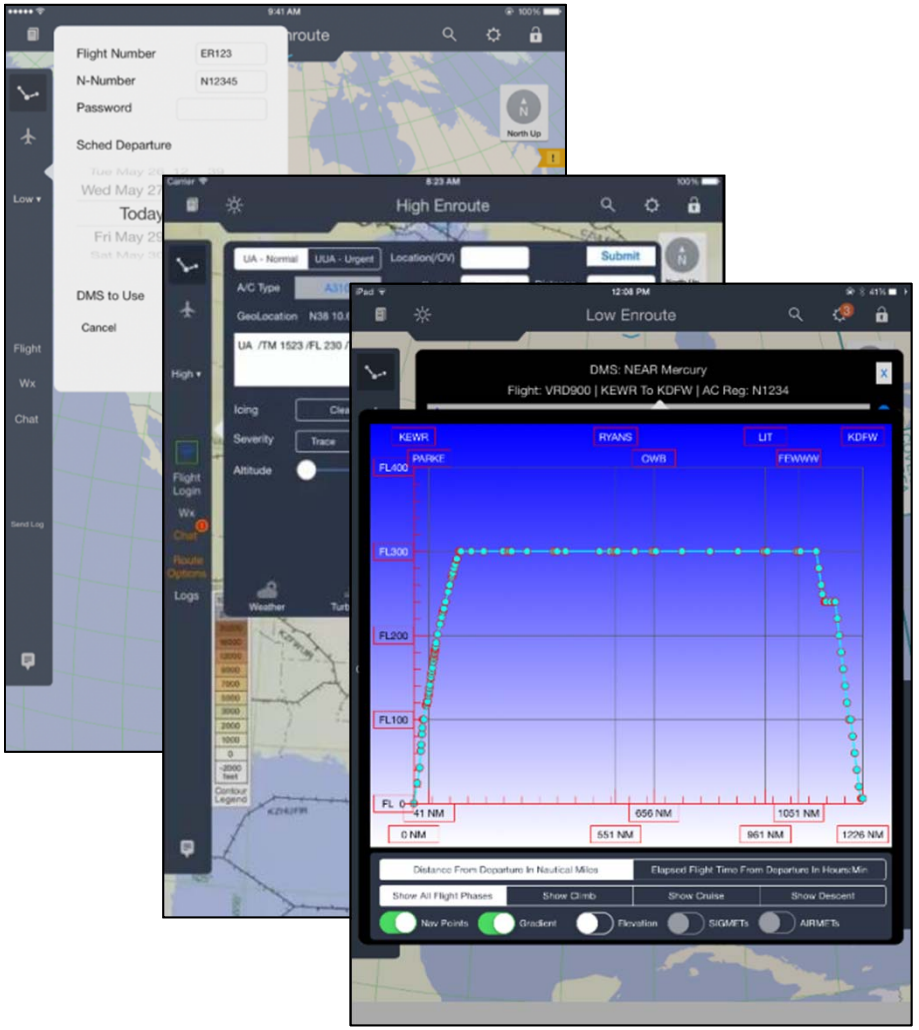
Integration with AOC and Avionics

- Potential for improved trajectory planning through integration with optimization tools and automation systems
  - AOC
  - FMS



Human Factors

- Implementation of EFB applications requires extensive human factors consideration
  - DMS Login Method
    - Balance security and functionality
  - Button placement
  - Map clutter



Future Potential

- SWIM Data Maturity
- IP Data Link Advancements
- Increased EFB and Avionics Integration
- Air Traffic Management Automation Improvements
- Automated Position Reporting
- Automated Aircraft Sensor Data Downlink
- Much More…

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