FAA Data Comm Program Update
ASRI AFC June 2014

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Data Comm Overview

- **Provides data communications between the cockpit and controllers to replace some current voice communications**
  - Safety-of-flight air traffic control (ATC) clearances, instructions, traffic flow management, flight crew requests and reports
  - Provides direct link between ground automation and flight deck avionics

- **Transformational program critical to the success of NextGen operations**
  - Provides infrastructure supporting other NextGen programs and operational improvements
  - Enables efficiencies not possible using current voice system

Operational Benefits
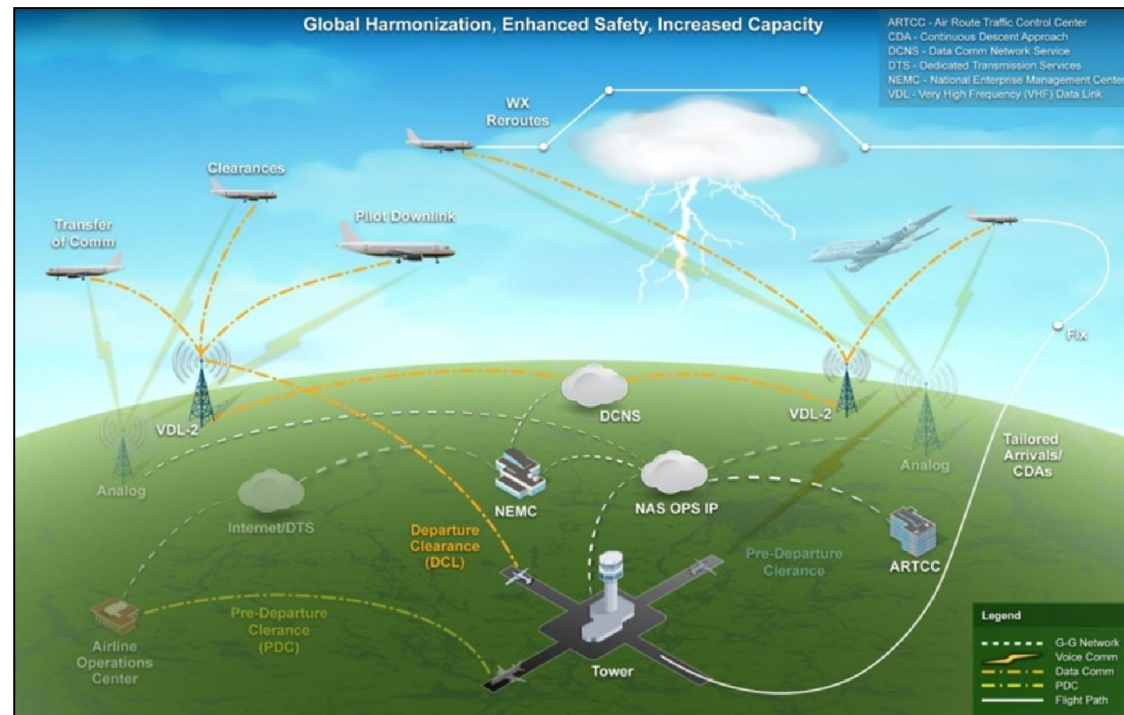
- Increased controller productivity leading to increased capacity
- Enables NextGen services (e.g., enhanced re-routes, trajectory operations)
- Reduced communication errors
- Improves controller and pilot efficiency thru automated information exchange
- Reduced impact of ground delay programs, airport reconfigurations, convective weather, congestion, and other causes

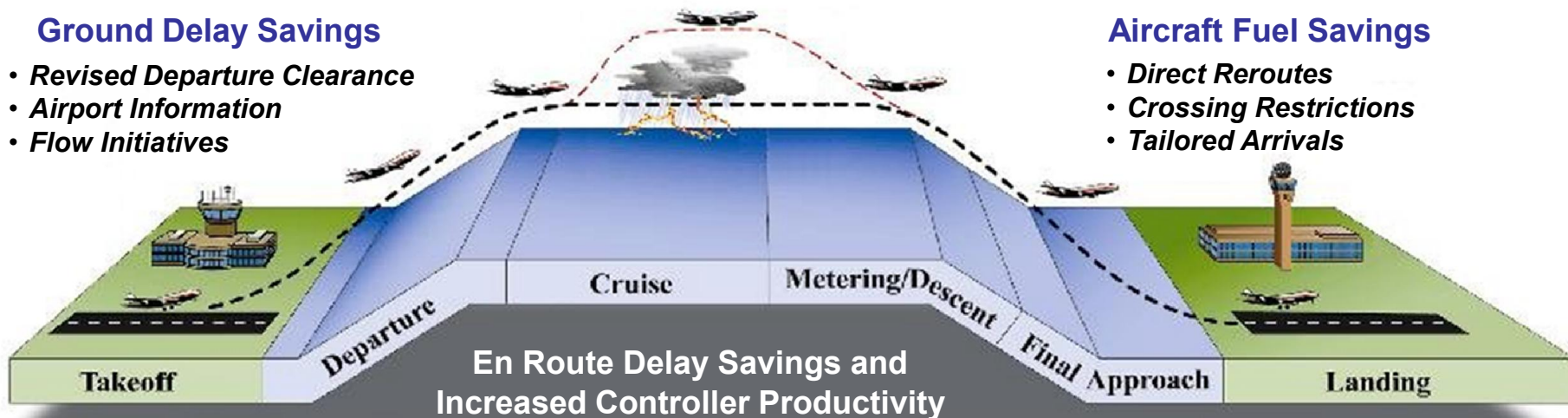**Increased Safety – Reduced Operational Errors**

- *Clearer, enduring communications*

Ground Delay Savings

- *Revised Departure Clearance*
- *Airport Information*
- *Flow Initiatives*

Aircraft Fuel Savings

- *Direct Reroutes*
- *Crossing Restrictions*
- *Tailored Arrivals*

Cruise

Metering/Descent

Departure

Final Approach

Takeoff

En Route Delay Savings and Increased Controller Productivity

Landing

- *Seamless Uplink of Flow Initiatives / TFM Reroutes – "Go" Button*
- *Comm Transfer Workload Reduction*

- *More Efficient Delivery of Clearances*
- *Allows Uplink of More Complex Clearances*
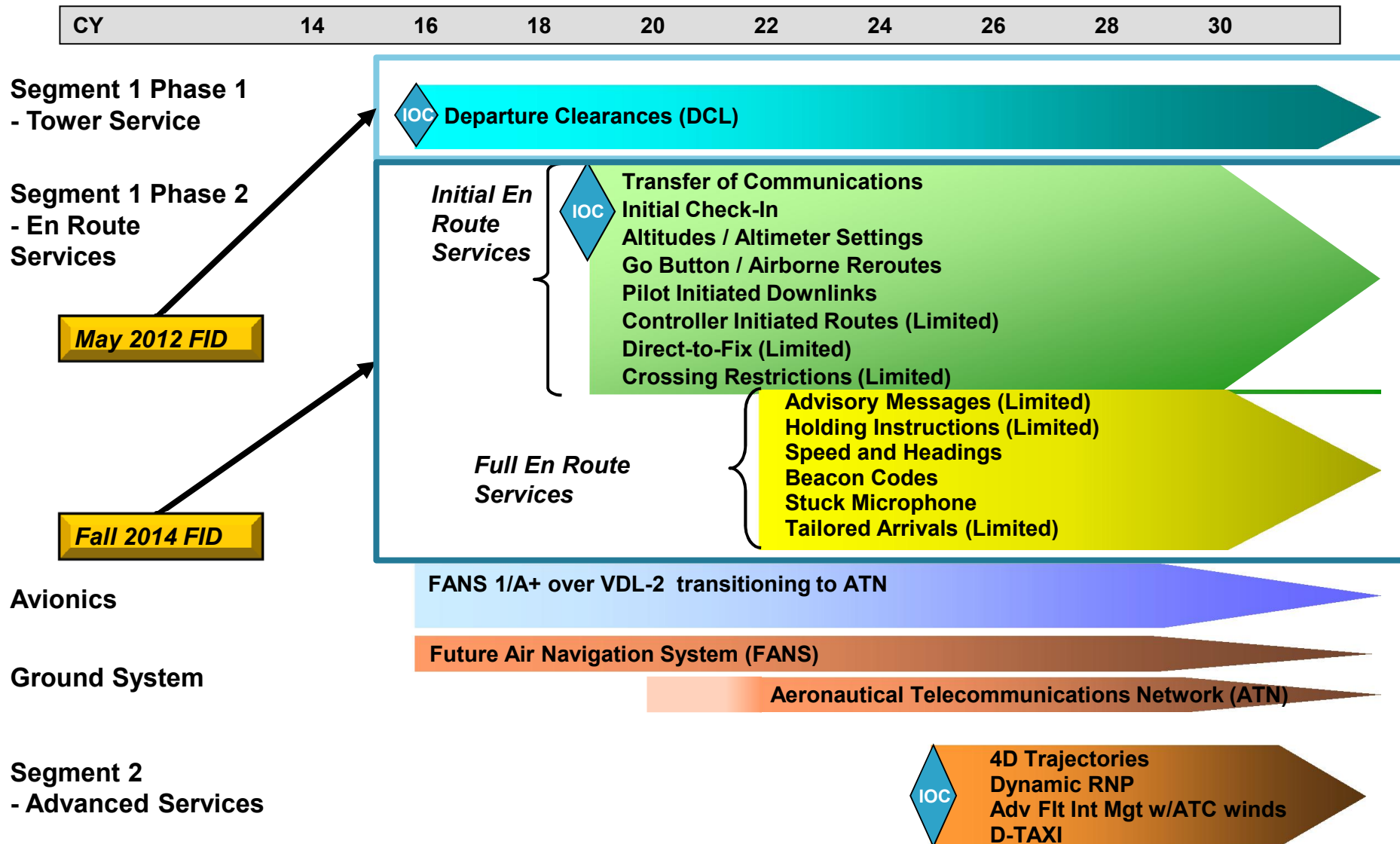- *En Route Notifications*

Evolution of Services

- Strategy is to deploy services incrementally
  - Implements basic services at airport towers initially
    - Leverages existing equipage – FANS 1/A+
    - Leverages existing air-ground networks – ARINC & SITA
    - Delivers ground system infrastructure for future services (i.e., En Route) with initial deployment

- Program Phases
  - Segment 1 Phase 1 (S1P1)
    - Initial Departure Clearance (DCL) Tower Service
  - Segment 1 Phase 2 (S1P2)
    - Initial En Route services
    - Follow-On En Route services
  - Segment 2 (S2) – Advanced trajectory services

- Services aligned with users' requested operations
  - Guidance from RTCA Task Force 5 Operational Improvements
  - Targets delay reductions and capacity/throughput increases

Services Strategy

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CY		14	16	18	20	22	24	26	28	30

Segment 1 Phase 1
- Tower Service

IOC **Departure Clearances (DCL)**

Segment 1 Phase 2
- En Route Services

Initial En Route Services

IOC
Transfer of Communications
Initial Check-In
Altitudes / Altimeter Settings
Go Button / Airborne Reroutes
Pilot Initiated Downlinks
Controller Initiated Routes (Limited)
Direct-to-Fix (Limited)
Crossing Restrictions (Limited)

May 2012 FID

Full En Route Services

Advisory Messages (Limited)
Holding Instructions (Limited)
Speed and Headings
Beacon Codes
Stuck Microphone
Tailored Arrivals (Limited)

Fall 2014 FID

Avionics

FANS 1/A+ over VDL-2 transitioning to ATN

Ground System

Future Air Navigation System (FANS)

Aeronautical Telecommunications Network (ATN)

Segment 2
- Advanced Services

IOC
4D Trajectories
Dynamic RNP
Adv Flt Int Mgt w/ATC winds
D-TAXI

Acquisition Program Baseline (APB) Milestones

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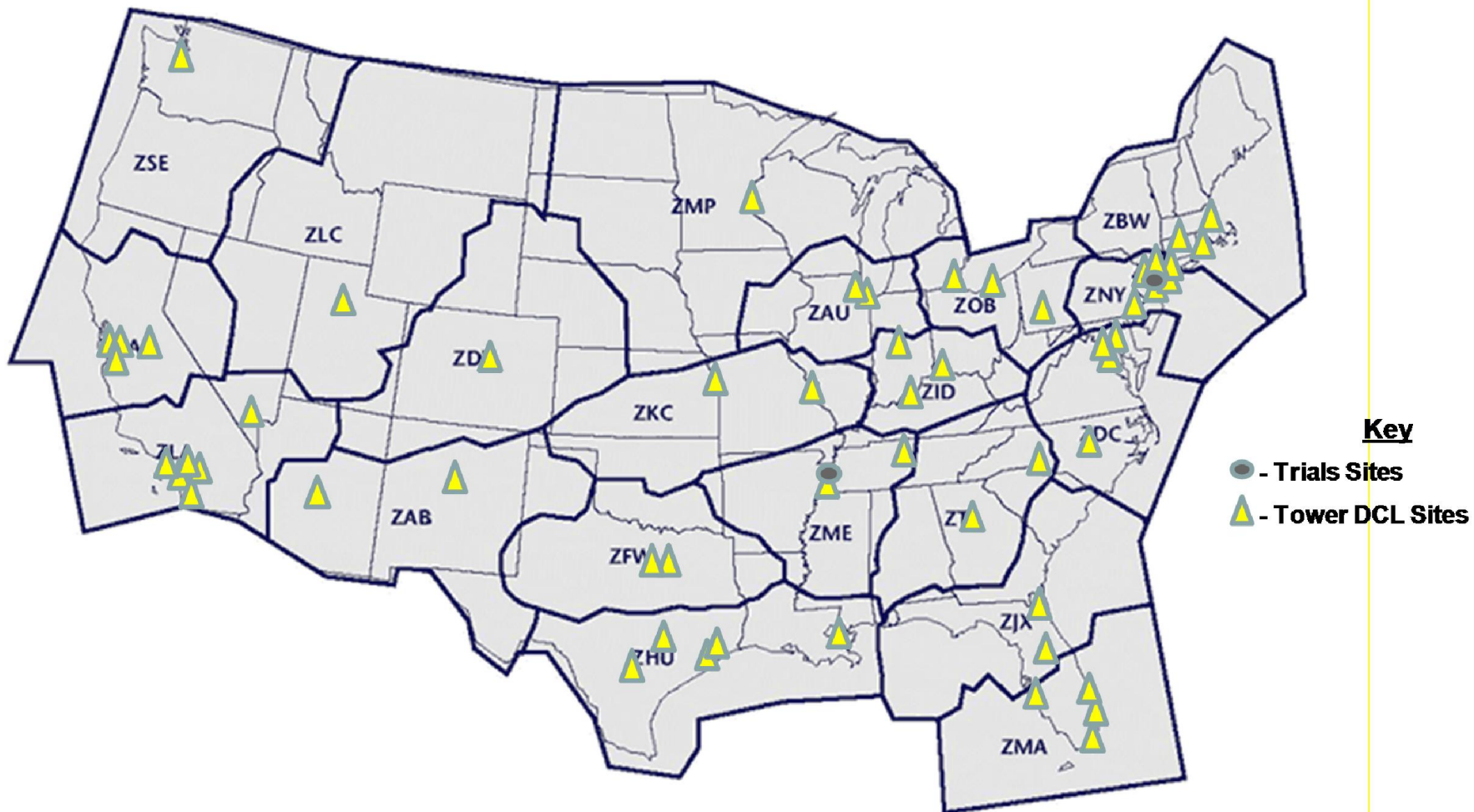| Milestone	Date
✔ ERAM Preliminary Design Review (PDR)	September 2011
✔ ERAM Critical Design Review (CDR)	March 2012
✔ FID: Final Investment Decision for ERAM & TDLS	May 2012
✔ DCIS Contract Award*	July 2012
✔ TDLS Preliminary Design Review (PDR)**	December 2012
✔ TDLS Critical Design Review (CDR)***	August 2013
✔ ERAM Initial Test Release (ITR)	June 2014
Operational Test (OT&E)	November 2015
First-Site Initial Operational Capability (IOC)	March 2016
In-Service Decision (ISD)	December 2016
Operational Readiness Decisions (ORD)	April 2017
Last-Site IOC	May 2019

Key: | Complete | On Track | May Be Missed | Missed |

*The DCIS contract was awarded in September 2012. The award delay does not impact any of the program milestone dates
** TDLS PDR completed in October 2012
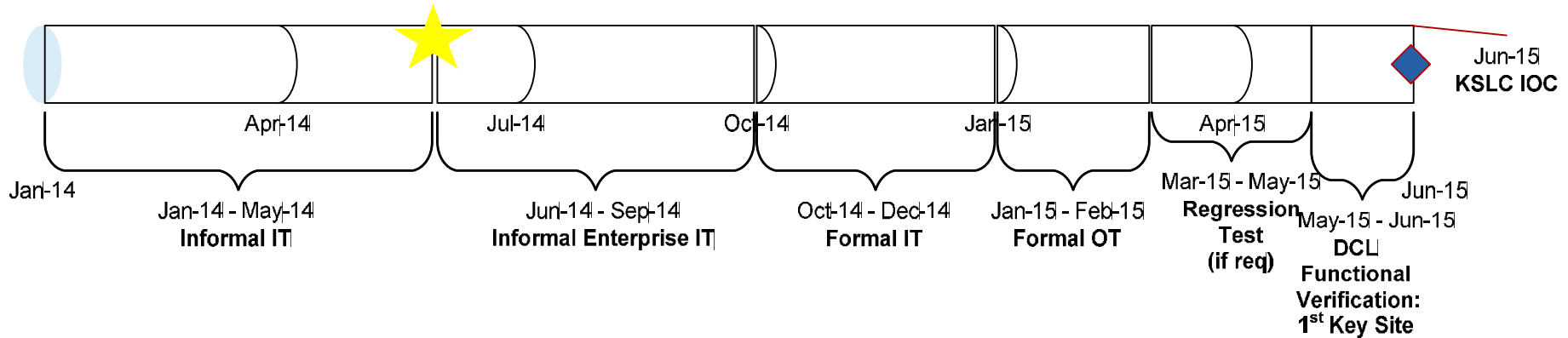*** TDLS CDR completed in July 2013
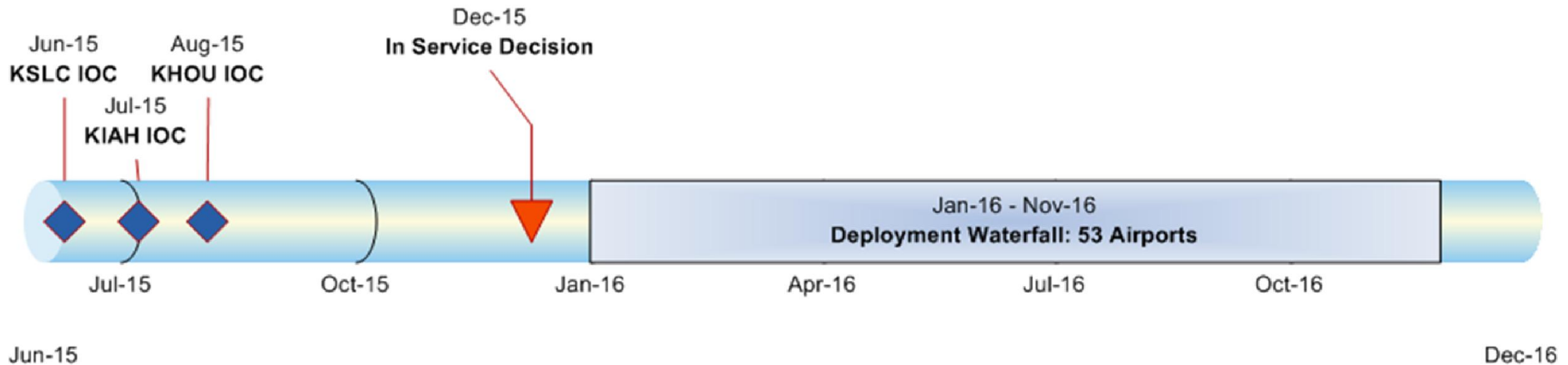
Data Comm Deployment Locations

Key
- Trials Sites
- Tower DCL Sites

Implementation Schedule

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Integration & Test Activities Leading up to KSLC IOC

Jan-14 — Apr-14 — Jul-14 — Oct-14 — Jan-15 — Apr-15 — Jun-15 **KSLC IOC**

Jan-14 - May-14
Informal IT

Jun-14 - Sep-14
Informal Enterprise IT

Oct-14 - Dec-14
Formal IT

Jan-15 - Feb-15
Formal OT

Mar-15 - May-15
Regression Test
(if req)

May-15 - Jun-15
DCL
Functional
Verification:
1st Key Site

Complete Waterfall Test & Deployment Activities

Jun-15
KSLC IOC

Jul-15
KIAH IOC

Aug-15
KHOU IOC

Dec-15
In Service Decision

Jan-16 - Nov-16
Deployment Waterfall: 53 Airports

Jun-15 — Jul-15 — Oct-15 — Jan-16 — Apr-16 — Jul-16 — Oct-16 — Dec-16

DCIS Overview

Harris led DCIS Team partners with the FAA to deliver:

- Data Comm Network Services
  - Air-Ground Network using ARINC & SITA
  - Service Delivery & System Monitoring
- Data Comm Integration & Test
  - Supports I&T activities at WJTHC and field sites
- Avionics Equipage
- Benefits, Metrics, & Outreach
- Engineering Services
  - DCL Trials Support
  - Avionics Interoperability Engineering
  - En Route Engineering
  - End to End System Performance and Operational Metrics Collection

DCNS Overview

- Data Communications Network Services (DCNS)
  - Contract between Harris and FAA to provide air-ground network connectivity for the Data Comm program
  - Harris subcontracts with ARINC and SITA
- Utilizes shared air-ground VDL Mode 2 links
- DCNS provides air-ground Air Traffic Services connectivity to all airspace users

DCNS Highlights
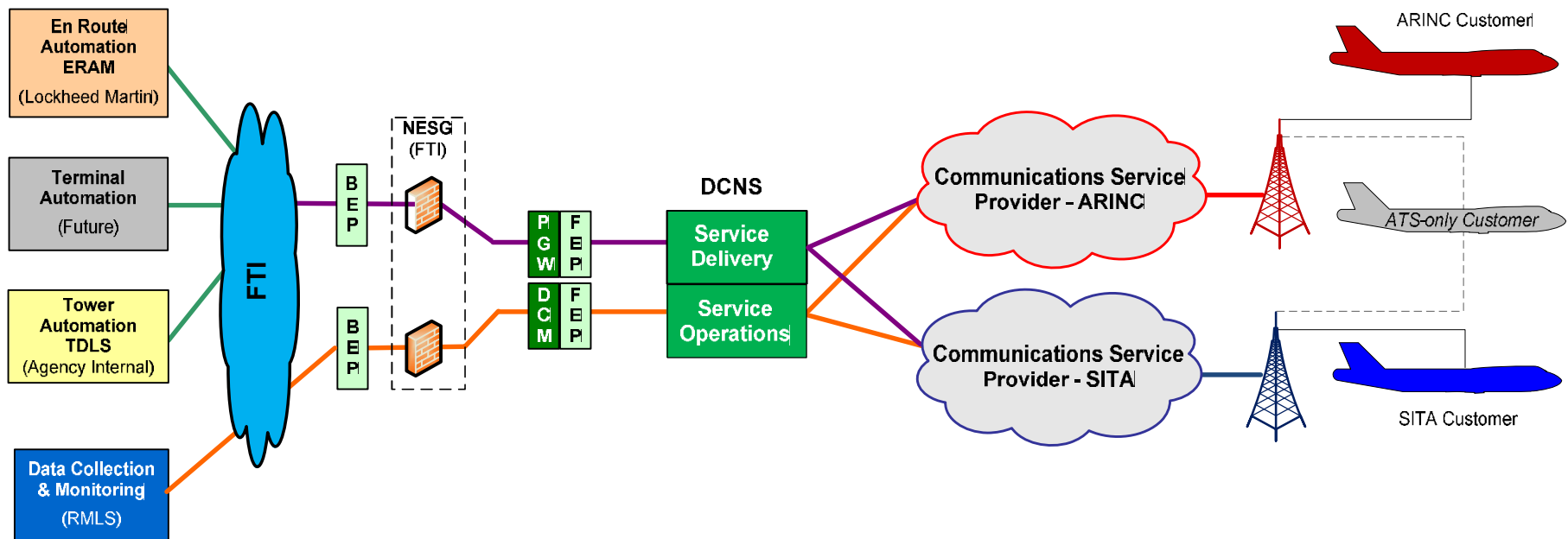
- **Service Volume:** FAA Unit for Ordering DCNS Service
  - Tower Services = Airport
  - En Route Services = ARTCC Airspace
- Managed Service – Provides VDL Mode 2 Air-Ground Services
  - Service Level Agreements for Availability, Latency, and Message Throughput
    - Various levels for service restoral time based on criticality of service volume
  - Single Service Delivery Point for FAA (Harris manages CSP connectivity)
  - 24/7/365 Performance Monitoring
- Air Traffic Service Air-Ground Messaging Provided to All Airspace Users
  - FAA DCNS Service Pays for all domestic FANS 1/A traffic over **VDL Mode 2**
  - Airspace users without an agreement with ARINC or SITA are also accommodated for ATS traffic
  - Delivers ACARS traffic between FAA and CSPs regardless of air-ground media (VDL Mode 2, VDL Mode 0/A (POA), Satcom, etc)
- No required changes to aircraft media management
  - DCNS takes advantage of existing media management functions in the aircraft's CMU

DCNS Update

- Completed Build 1 Function Testing
  - Build 1 Provides air-ground thread for FANS 1/A over VDL Mode 2 (and other ACARS Media)
- DCNS Ted Bed Operational at FAA Tech Center in NJ
- Site surveys and necessary upgrades progressing well
  - Sites surveys and coverage drive surveys well under way at TDLS Deployment Locations

DCNS Spectrum

- ARINC & SITA will continue to operate their VHF services just like today
- VHF spectrum will continue to be a shared resource between AOC and ATC
- VDL Mode 2 spectrum will continue to be allocated from the upper portion of the Aeronautical En Route Service (AES) allocated by ASRI
- Additional spectrum from the FAA portion of the upper band will be made available when
  - ASRI channel bandwidth capacity has been exhausted
  - A demonstrated need for additional capacity to justify the additional spectrum
- Harris and FAA are currently conducting an analysis of FAA spectrum needs
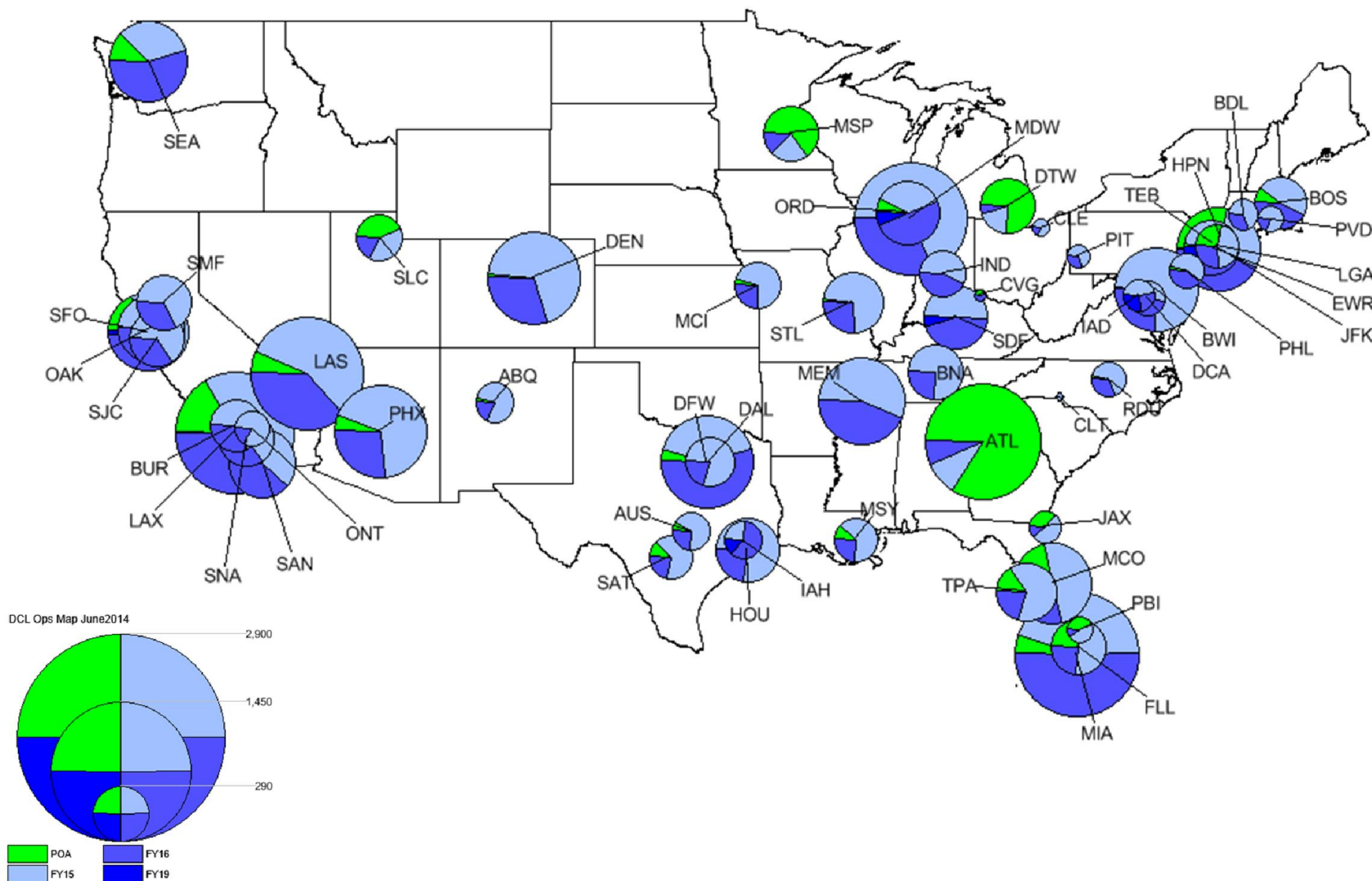 - **Expected Delivery: September 2014 (delayed from June 2014)**

Avionics Equipage Update

- Achieved 100% of commitments for FAA's equipage objective ahead of schedule
- Commitments from 8 Airlines
- First equipped aircraft completed earlier this year

DCL Trials Update

- **Tower Departure Clearance (DCL) trials at Memphis and Newark using Data Comm Trials Automation Platform (DTAP)**

- **Validates requirements and operational training / procedures**
  - Reduces risk on production system technical characteristics and operational issues including avionics interoperability

- **Aligns stakeholders in support of program**
  - Industry involvement through Data Comm Implementation Team (DCIT)

- **Memphis (MEM) Trials**
  - Full fleet operations since September 2013
  - Regular daily operations by FDX (MD-11F & B777F)

- **Newark (EWR) Trials**
  - Daily operations by FDX (MD-11F & B777F), UAL (B777), and UPS (MD-11F, B767)
  - Other participants include BAW, DLH, SAS – awaiting FAA approval to resume operations

En Route CPDLC Update

- Working with FAA to solidify the En Route Data Comm service definition

- Participating and coordinating several risk reduction activities leading to Final Investment Decision this fall

- Working with FAA on defining operational requirements for air-ground data link
  - VDL Mode 2 Multi-Frequency Timeline
  - FAA Policy for use of FANS 1/A over POA in En Route Airspace

Air Carrier Outreach

- Preparing Airlines for FAA Integration & Test activities
  - Coordinated through DCIT Ops Management Working Group
  - Working with aircraft operators to track readiness for IOC
  - Aircraft to support initial operations at key sites
  - Ensure program waterfall is aligned with aircraft using the service

- More information available on the DCIT Website

Next Steps

- Progress on DCNS Deployment
- Continue Supporting FAA
    - Tower Services Integration & Test Effort
    - DCL Trials
    - En Route Capability Assessments
- Work with Aircraft Operators on DCL Readiness as we approach IOC
- Track and validate aircraft equipped with FANS 1/A(+) and VDL Mode 2 as part of Equipage Initiative