L3HARRIS™
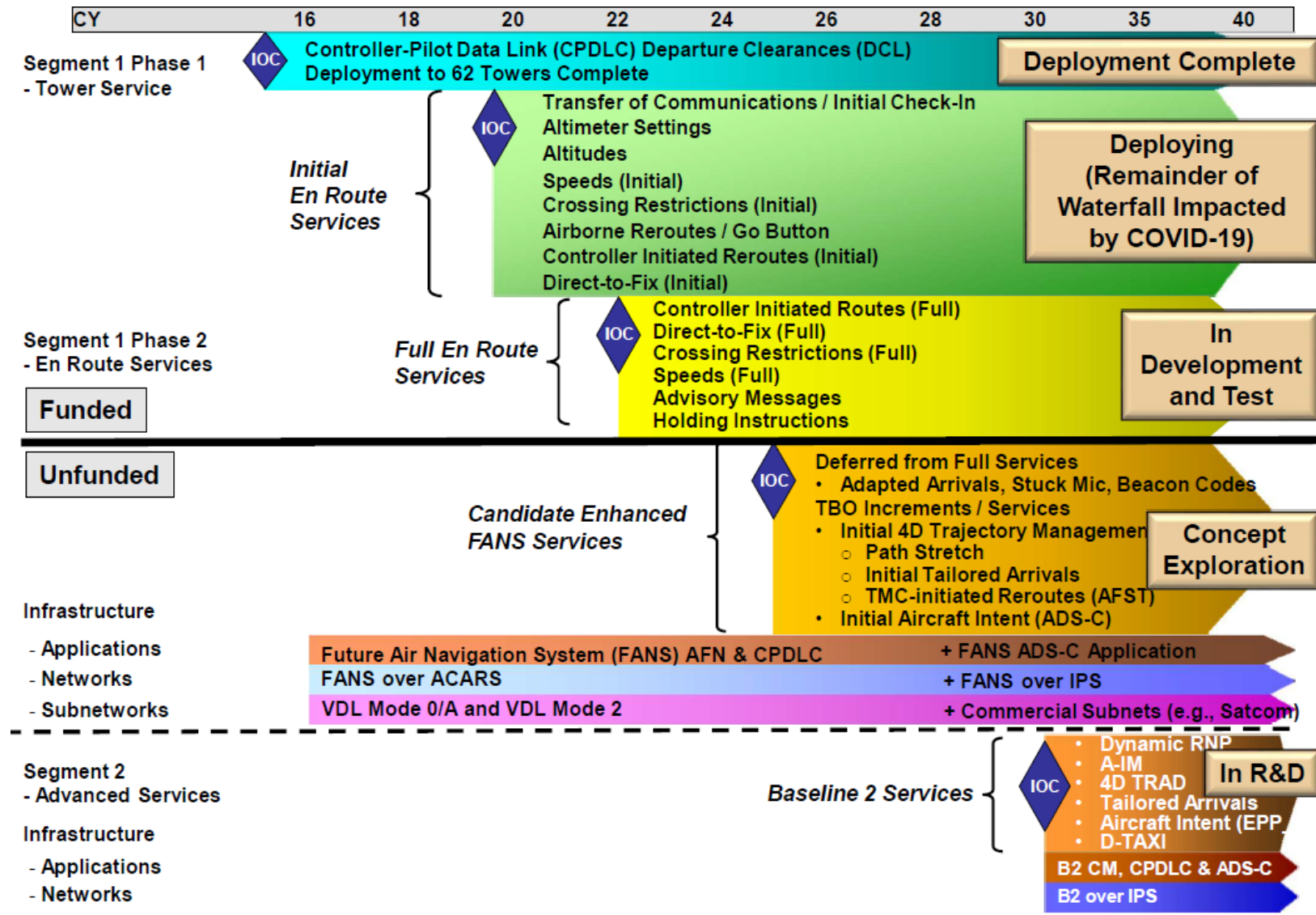
FAA DATA COMM
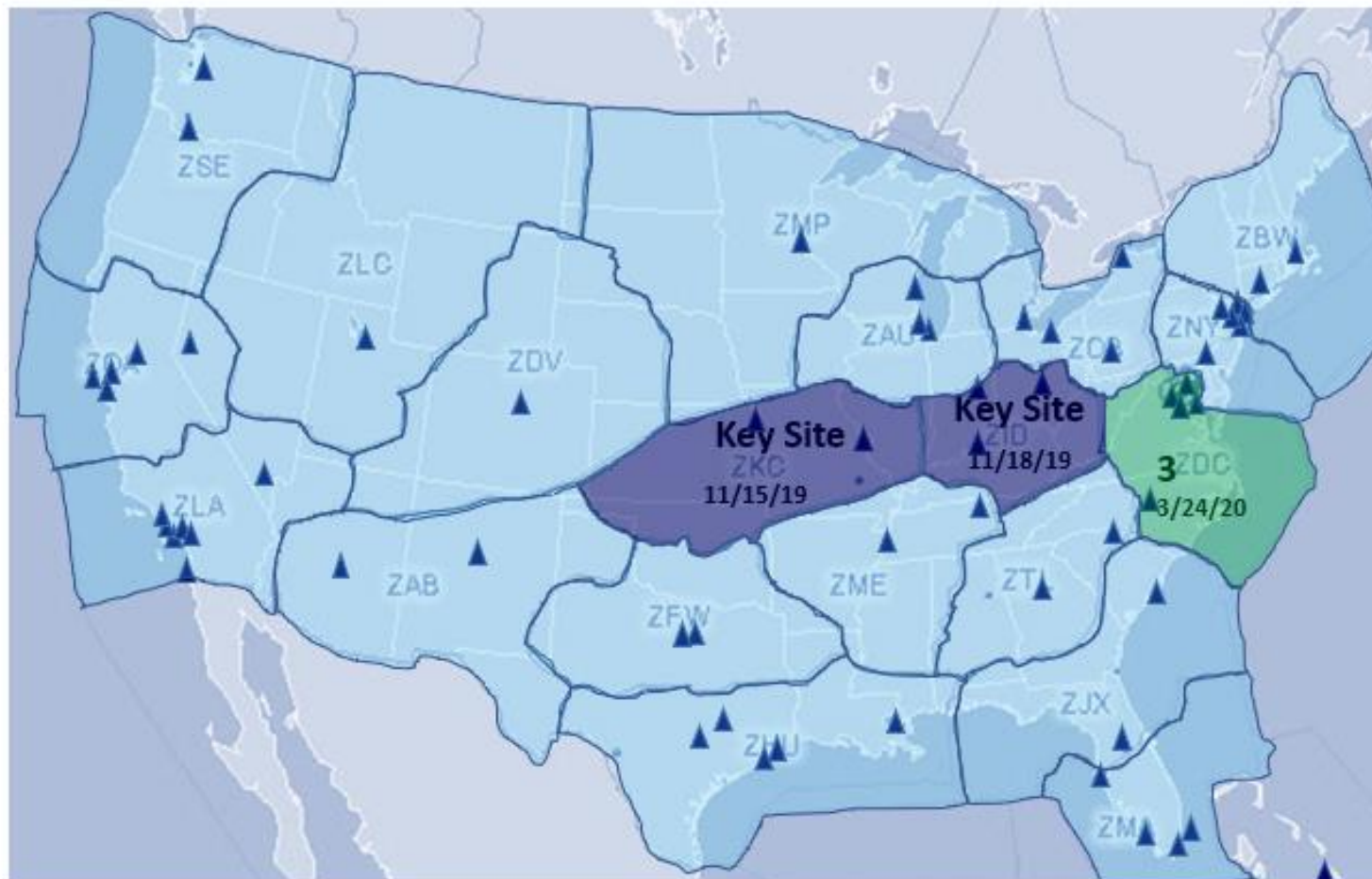# US DOMESTIC CPDLC

July 23, 2020

Data Communication overview

→ Provides data communications services between pilots and air traffic controllers, supplementing existing voice communications capabilities

→ Provides a data link between ground automation systems and flight deck avionics for air traffic control (ATC) clearances, instructions, traffic flow management, and flight crew requests

→ Controllers will be able to deliver instructions with a push of a button and without the need to utilize voice frequencies

→ Enables the transmission of complex instructions that can be quickly and correctly loaded into an aircraft's flight management system, upon acceptance by the pilot

→ Enables NextGen Initiatives and Trajectory-Based Operations

Data Comm services roadmap

CY	16	18	20	22	24	26	28	30	35	40

Segment 1 Phase 1 - Tower Service

IOC — Controller-Pilot Data Link (CPDLC) Departure Clearances (DCL) Deployment to 62 Towers Complete

Deployment Complete

Initial En Route Services

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

Deploying (Remainder of Waterfall Impacted by COVID-19)

Segment 1 Phase 2 - En Route Services

Full En Route Services

IOC —
- Controller Initiated Routes (Full)
- Direct-to-Fix (Full)
- Crossing Restrictions (Full)
- Speeds (Full)
- Advisory Messages
- Holding Instructions

In Development and Test

Funded

Unfunded

Candidate Enhanced FANS Services

IOC —
Deferred from Full Services
- Adapted Arrivals, Stuck Mic, Beacon Codes

TBO Increments / Services
- Initial 4D Trajectory Management
  - Path Stretch
  - Initial Tailored Arrivals
  - TMC-initiated Reroutes (AFST)
- Initial Aircraft Intent (ADS-C)

Concept Exploration

Infrastructure
- Applications
- Networks
- Subnetworks

Future Air Navigation System (FANS) AFN & CPDLC + FANS ADS-C Application

FANS over ACARS + FANS over IPS

VDL Mode 0/A and VDL Mode 2 + Commercial Subnets (e.g., Satcom)

Segment 2 - Advanced Services

Infrastructure
- Applications
- Networks

Baseline 2 Services

IOC —
- Dynamic RNP
- A-IM
- 4D TRAD
- Tailored Arrivals
- Aircraft Intent (EPP)
- D-TAXI

In R&D

B2 CM, CPDLC & ADS-C

B2 over IPS

Data Comm operational status

CPDLC DCL by the numbers June 2020

16 US Air Carriers
(Part 121)

65 Non-US Air Carriers
(Part 129)

1,900+ Business Aviation Operators
(Parts 91, 91K, 135)

62 Airports

67 Aircraft Types

Over 5,900 Equipped Aircraft

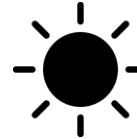# CPDLC DCL benefits (2016 - June 2020)

Saved 2.21M minutes of radio time

Saved 1,582,240+ minutes of airspace user time

Served 1.09B+ passengers

Cleared 8,222,015+ flights

Prevented 18.76M Kgs of CO_2 Emissions

Prevented 124,965+ readback errors

Data Comm en route CPDLC operator check list

OPERATOR STEPS FOR US DOMESTIC EN ROUTE CPDLC OPERATION

AVIONICS EQUIPAGE

- ❑ FANS 1/A approved version
- ❑ Approved version of VDL Mode 2 with Multi-Frequency
- ❑ ~~Contact OEM to ensure avionics meet the required~~ avionics configurations
- ❑ **Contact L3Harris to participate until NOTAM removed (Sept 2020)**

PROCEDURES & TRAINING

- ❑ Flight deck procedures & training
  - ❑ **Check with OEM for any avionics specific settings and pilot procedures necessary for equipment**
- ❑ Dispatch & maintenance procedures & training

OPERATIONAL APPROVAL

- ❑ FAA authorization (OpSpec A056, A003, etc)
  - ❑ No OpSpec or LOA required for Part 91 operators for domestic CPDLC

FILE AS EQUIPPED, LOGON AND PARTICIPATE

- ❑ Ensure file correct field 18 DAT/ Code
  - ❑ File 1FANS2PDC for DCL only
  - ❑ File 1FANSE2PDC for En Route
  - ❑ Additional filing information in NAS Data Comm Guide

More information: L3Harris.com/DataComm
DCIT@L3Harris.com

Supporting Documentation
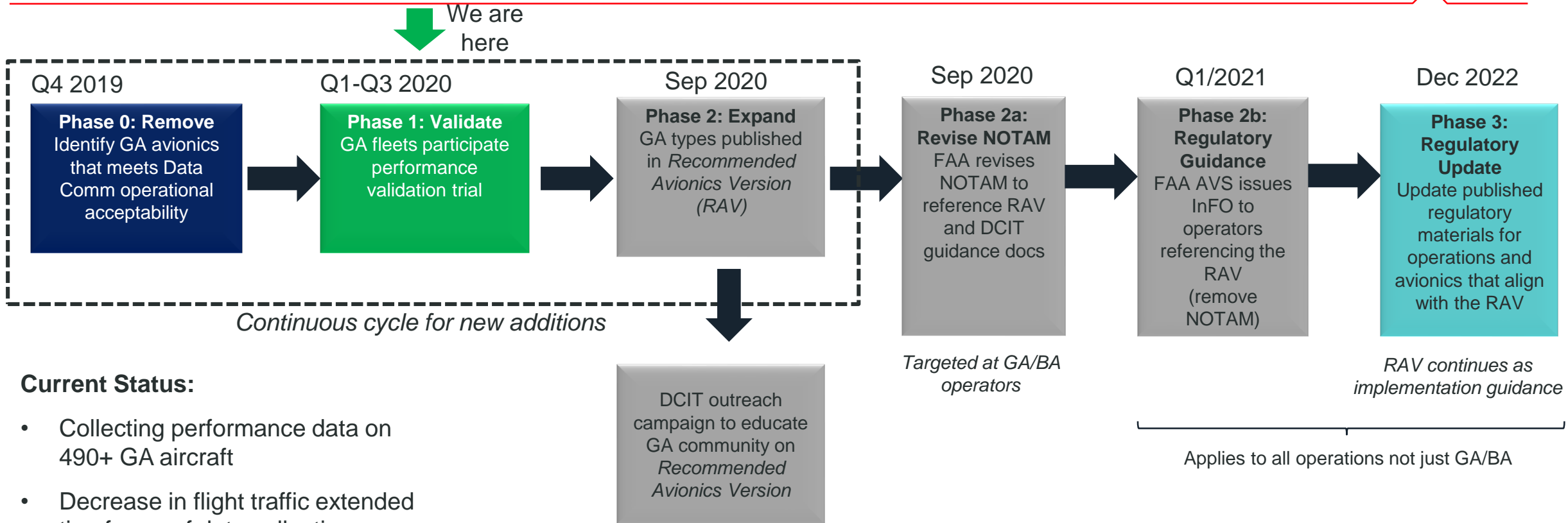
Procedures & Training
- Plain Language Pilot Handbook
- NAS Data Comm Guide
- Data Comm FAQ
- Data Comm End to End Document
- OEM CPDLC guidance
- CPDLC Logon Guidance

Operational Approval
- AC 90-117 Data Comm
- Data Link Communication Compliance Guide

Plan for Data Comm avionics GA/BA return

We are here

Q4 2019

Phase 0: Remove
Identify GA avionics that meets Data Comm operational acceptability

Q1-Q3 2020

Phase 1: Validate
GA fleets participate performance validation trial

Sep 2020

Phase 2: Expand
GA types published in *Recommended Avionics Version (RAV)*

Continuous cycle for new additions

Sep 2020

Phase 2a: Revise NOTAM
FAA revises NOTAM to reference RAV and DCIT guidance docs

Targeted at GA/BA operators

Q1/2021

Phase 2b: Regulatory Guidance
FAA AVS issues InFO to operators referencing the RAV (remove NOTAM)

Dec 2022

Phase 3: Regulatory Update
Update published regulatory materials for operations and avionics that align with the RAV

RAV continues as implementation guidance

DCIT outreach campaign to educate GA community on *Recommended Avionics Version*

Applies to all operations not just GA/BA

Current Status:

- Collecting performance data on 490+ GA aircraft

- Decrease in flight traffic extended timeframe of data collection

- Forecast initial GA types will successfully complete validation and added to *Recommended Avionics Versions* by September 2020

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Data Comm resources

Pilot Handbook: U.S. Domestic En Route Controller Pilot Data Link Communications

Guidance material for U.S. Domestic En Route CPDLC operations that includes; filing, message/clearance types, eligibility, quick reference card

U.S. Domestic Flight and Route Planning Guide

Guidance on successful filing for U.S. Domestic CPDLC which includes; J Codes, DAT Codes, Other Information field, SID's & STAR's guidance

U.S. Domestic En Route CPDLC Logon/Session Scenarios

Common Logon/Session scenarios when using U.S. Domestic En Route CPDLC

Additional Data Comm Documentation

- Current en route center activation map

- Operational Problem Reporting (OPR) form

- US Domestic CPDLC demonstration videos

More information: L3Harris.com/DataComm
Contact: DCIT@L3Harris.com

CPDLC logon guidance
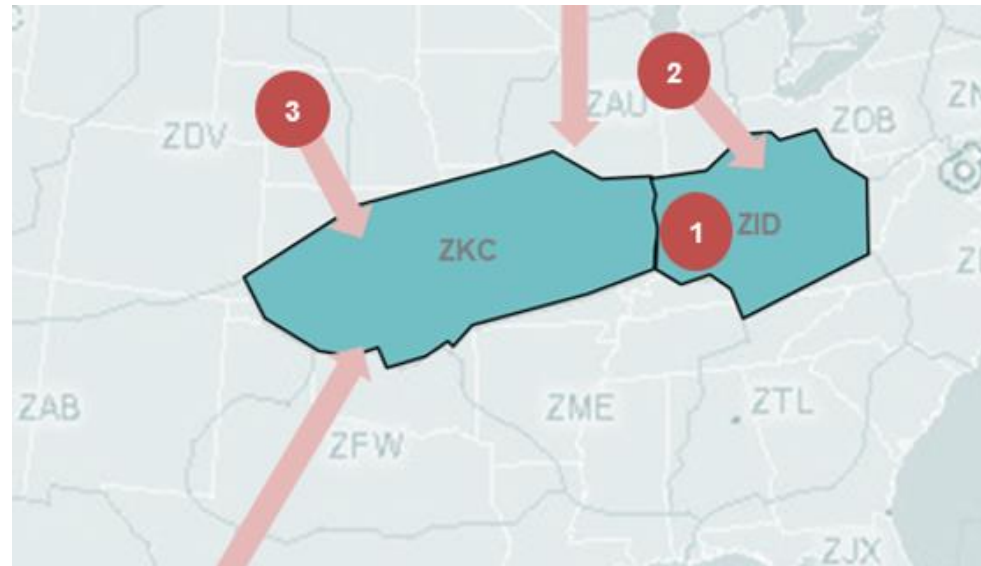
1   **Departures from CPDLC DCL Airports within an active CPDLC En Route Center**

- KUSA session will remain active after departure
- No need to logon after take-off

2   **Departures from CPDLC DCL Airports outside of an active CPDLC En Route Center**

- KUSA session will remain established after departure
- No need to relogon before entering an active CPDLC En Route Center airspace

3   **Departures from non CPDLC DCL Airports, within or outside of an active CPDLC En Route Center**

- Manual logon after take-off or on the ground if adequate datalink coverage is available.
- KUSA logon while on the ground is only available in the lower 48 states and San Juan, Puerto Rico.

CPDLC logon guidance
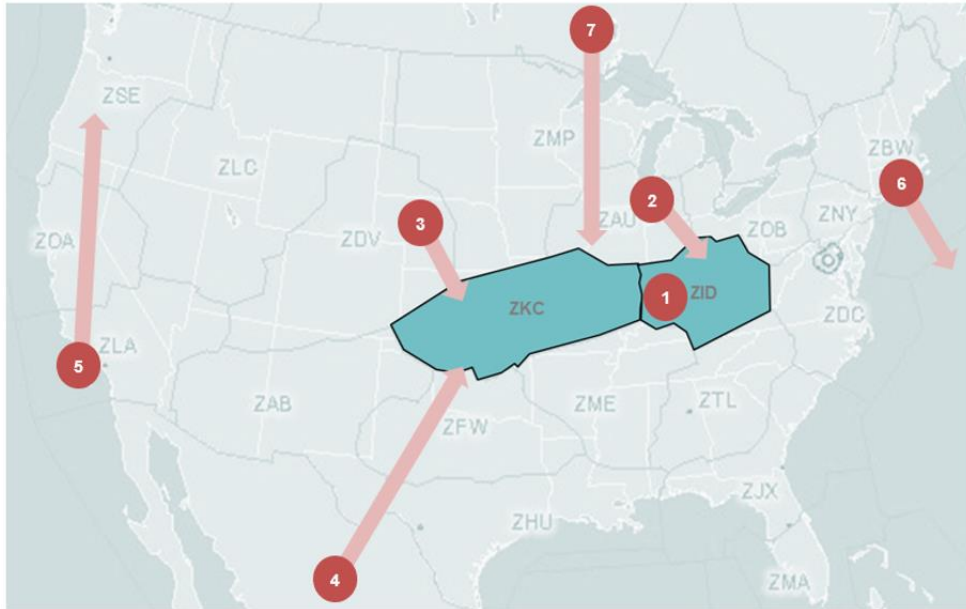
4 **Aircraft entering from adjacent Non-US airspace (e.g. Mexico) where CPDLC services are not provided.**

- Manual Logon, per SOP, prior to entering active U.S. Domestic En Route Center airspace
- KUSA session will not be established until reaching an active U.S. Domestic En Route Center airspace

5 **Departures from CPDLC DCL Airports outside active CPDLC En Route Centers, that fly through and land at a non-CPDLC En Route Center**

- KUSA session will remain established after departure
- KUSA session will terminate upon entry into arriving non-CPDLC En Route Center airspace

6 **Departures from CPDLC DCL Airports, and exiting into ATOP/Oceanic airspace**

- KUSA session will be terminated shortly after takeoff
- After KUSA session terminates, logon to ATOP/Oceanic

7 **Aircraft entering from adjacent airspace where CPDLC services are provided**

- Automated logon and session transfer to KUSA will be initiated by the adjacent CPDLC active facility.
- If automated session transfer fails, manually logon after disconnecting from non-US CPDLC airspace and before entering active US Domestic En Route Center Airspace.