

Administrative Announcements

Note: Only NAC Members, FAA Executive Participants, and Pre-Approved Presenters and Speakers will have panelist/video/speaking capabilities. All other participants will be view-only without speaking/video capabilities.

- **When called upon to speak by the Chair:**

- > Please announce your name and organization
- > If using Zoom computer audio, click the Mute/Unmute button in the bottom left corner
- > If using the phone line audio without a participant ID, dial *6 to unmute, as well as your phone's mute button if enabled
- > If using a phone line and entered a participant ID, click the Zoom Mute/Unmute button, dial *6 to unmute your phone line, as well as your phone's mute button if enabled

In lieu of a roll call, all meeting participants will be captured in the meeting summary.

If you have any issues, please contact Antionette Johnson, via e-mail: Antionette.CTR.Johnson@faa.gov





NextGen Advisory Committee Meeting

August 22, 2024



Opening of Meeting

Chip Childs, NAC Chair
President & CEO (SkyWest Airlines)

Reappointed NAC Members

Representing Operators:

- **Mark Baker**, President and CEO of Aircraft Owners and Pilots Association (AOPA)
- **Ed Bolen**, President and CEO, National Business Aviation Association
- **Russell “Chip” Childs**, President and CEO of SkyWest and NAC Chair

Representing Aircraft Manufacturers:

- **Pete Bunce**, President and CEO of General Manufacturers Association (GAMA)
- **Craig Hoskins**, Vice President of Safety, Security and Technical Affairs for Airbus Americas

Representing Airports:

- **Candace McGraw**, CEO of Cincinnati Northern Kentucky International Airport

Representing NASA:

- **Robert Pearce**, Associate Administrator of Aeronautics Research Mission Directorate



New NAC Members

Representing Avionics:

- **Vipul Gupta**, Vice President and General Manager for Honeywell Aerospace Avionics
- **Scott Pfeiler**, Vice President of Product Development for Collins Aerospace

Representing Environmental Interest:

- **Emily Tranter**, National Coordination and Executive Director for National Organization to Insure a Sound-Controlled Environment (NOISE)

Representing International Sector:

- **Andreas Boschen**, Executive Director for SESAR 3 Joint Undertaking

Representing Labor Unions:

- **Jason Ambrosi**, President of Air Line Pilots Association
- **Rich Santa**, President of National Air Traffic Controllers Association
- **Dave Spero**, President of Professional Aviation Safety Specialist



New NAC Members

Representing Aircraft Manufacturers:

- **Howard McKenzie**, Vice President and Chief Engineer for Boeing Commercial Airplanes

Representing Operators:

- **Alan Kasher**, Executive Vice President of Daily Operations for Southwest Airlines
- **Dave Mets**, Vice President of Flight Operations for Alaska Airlines
- **Jessica Tyler**, Vice President of Integrated Operation Center for American Airlines



Industry Representatives

- **Patrick DiMento**, Vice President of Flight Operations, FedEx Express, Industry Representative for Cargo Operators
- **Ryan Gumm**, Senior Vice President of Flight Operations, Delta Air Lines, Industry Representative for Main Line Operators
- **Joe Heins**, Vice President of Network Operations, United Airlines, Industry Representative for Main Line Operators
- **Jeffrey Winter**, Vice President of Flight Operations, JetBlue Airways, Industry Representative for Main Line Operators



Public Meeting Announcement

Kimberly Noonan, NAC Committee Manager (FAA)

Public Meeting Announcement

NextGen Advisory Committee

August 22, 2024

This is the public meeting announcement for the NextGen Advisory Committee meeting convening today, August 22, 2024.

This meeting is being held pursuant to a notice published in the Federal Register on July 15, 2024. The agenda for the meeting was also included in the notice. The Assistant Administrator for NextGen, Paul Fontaine, who is the delegated Designated Federal Officer responsible for compliance with the Federal Advisory Committee Act, under which this meeting is being conducted.

On June 14, the U.S. Secretary of Transportation renewed the NAC's charter with the purpose of the NAC to receive advice on NextGen relating to the future of the Air Traffic Management System and the integration of new technologies.

Today's meeting is open to the public. Members of the public may provide written comments in advance if they wish for them to be considered by the Chair for inclusion into the record of the meeting.





NAC Chair Report

Chip Childs, NAC Chair
President & CEO (SkyWest Airlines)

Motion for NAC Approval

- March 21, 2024 – NAC Meeting Summary Package Draft





NAC Chair Report

Chip Childs, NAC Chair

President & CEO (SkyWest Airlines)



European Air Traffic Management Master Plan Update

Andreas Boschen, Executive Director, SESAR 3 Joint Undertaking (FAA)

Our vision: making Europe the most efficient and environmentally friendly sky to fly in the world



Traffic management will be integrated into a multimodal transport system, including innovative solutions like air taxis, facilitating seamless, timely, and eco-friendly door-to-door passenger travel.



The continuous optimisation will be the new norm thanks to a **new service delivery model** and **high connectivity** with large volumes of data flowing in an effective and secured manner across trusted users.



All flights will operate to maximise aircraft capabilities, **reducing aviation's overall climate impact** (CO2 and non-CO2).



For certain phases of flight, **the system will be fully automated and able to handle both nominal and non-nominal situations.**



Air traffic management processes and services will **optimise each flight trajectory**. This optimisation is **systematic, continuous and extremely precise.**



In this new environment, **the role of the human has significantly evolved**, performing only the tasks that are too complex for automation to handle.

The ambition is to fully implement the Digital European Sky by 2045 with 2 key intermediate milestones for 2030 and 2035



TIME

By 2030, to complete the development of Phase D.

By 2035, to complete the implementation of Phase C.

By 2045, to complete the implementation of Phase D.

TODAY

2025

2030

2035

2045

PHASE D

DEVELOPMENT PRIORTIES

PHASE C

STRATEGIC DEPLOYMENT OBJECTIVES

Master Plan 2024

PHASE B

VOLUNTARY DEPLOYMENT WITH COMMON
PROJECT 1 SUPPORT

PHASE A

VOLUNTARY DEPLOYMENT WITH COMMON
PROJECT 1 SUPPORT

PERFORMANCE



10 Strategic Deployment Objectives to accelerate market uptake of SESAR Solutions by early movers and drive the evolution of the regulatory framework



**SDO
1**

ALERT FOR REDUCTION OF
COLLISION RISKS ON TAXIWAYS &
RUNWAYS



**SDO
2**

OPTIMISING AIRPORT AND
TMA ENVIRONMENTAL
FOOTPRINT



**SDO
3**

DYNAMIC AIRSPACE
CONFIGURATION



**SDO
4**

INCREASED AUTOMATION
SUPPORT



**SDO
5**

TRANSFORMATION TO
TRAJECTORY-BASED
OPERATIONS (TBO)



**SDO
6**

VIRTUALISATION OF
OPERATIONS



**SDO
7**

TRANSITION TOWARDS
PERFORMANCE OF AIR-GROUND
CONNECTIVITY (MULTILINK)



**SDO
8**

SERVICE-ORIENTED DELIVERY
MODEL (DATA DRIVEN AND
CLOUD BASED)



**SDO
9**

CNS OPTIMISATION,
MODERNISATION AND
RESILIENCE



**SDO
10**

IMPLEMENT INNOVATIVE AIR
MOBILITY (IAM) & DRONE
OPERATIONS

12 strategic development priorities for future research activities in ATM from 2025



Industrial Research

- IR-1** Transformation to trajectory-based operations
- IR-2** Transition towards high performance of air-ground connectivity (multilink)
- IR-3** Future En-Route and TMA ground platforms
- IR-4** Future airport platform
- IR-5** Autonomy and digital assistants for the flight deck
- IR-6** U3 U-space advanced services, IAM and vertiports

Exploratory Research

- FR-1** ATM impact on climate change
- FR-2** Digital flight rules
- FR-3** Investigate quantum sensing and computing applied to ATM

Fundamental Research

Applied Research

- AR-1** Research to help shape the future regulatory framework for a Digital European Sky
- AR-2** Definition of U4 U-space full services
- AR-3** Integration of the next generation aircraft for zero/low emission aviation

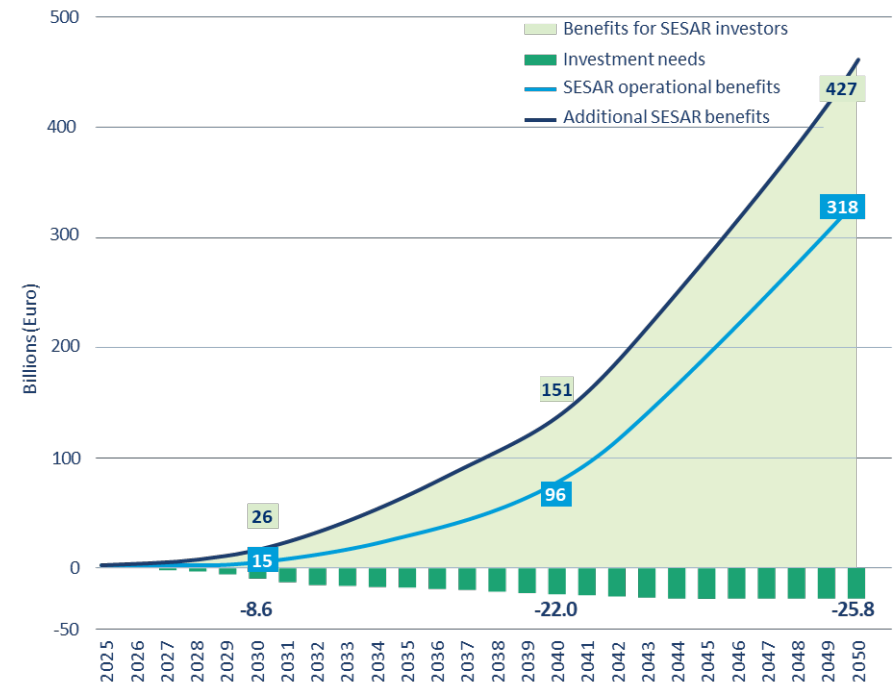
Investments and benefits



- Investment needs calculated at €25.8 bn for the period 2025 – 2050
- Operational benefits estimated at €318 bn, rising to €427 bn if additional benefits (more flights become possible) are included
- The return on investment for investors is projected to be € 7 for every euro invested in SESAR by 2040, increasing to € 17 by 2050

PLUS:

- 400 million tons of CO₂ could be saved with the roll-out of the vision by 2050



Conclusion



**Formal adoption of new Master Plan in December 2024,
built with strong stakeholder involvement and commitment**

**Roll-out as from 2025
(new research calls and implementation of strategic deployment objectives)**

**In partnership with ICAO and bilateral partners such as FAA
(in particular on TBO and new air/ground connectivity)**

**THANK YOU FOR
YOUR ATTENTION**

Andreas Boschen
Executive Director
SESAR Joint Undertaking
Andreas.Boschen@sesarju.eu





FAA Report

Paul Fontaine, Assistant Administrator, NextGen & NAC DFO Delegate (FAA)



FAA Report

Tim Arel, Chief Operating Officer (FAA)



Facility Replacement and Radar Modernization and Surveillance Strategy

Michael Freie (FAA)

Facility Replacement & Radar Modernization (FRRM) Proposal

Background

- FAA owns over 370 air traffic control facilities
 - > Air Traffic Control Towers (ATCT), with an average age of 40 years
 - > Terminal Radar Approach Control (TRACON) Facilities, with an average age of 27 years
 - > Air Route Traffic Control Centers (ARTCC), with an average age of 61 years
 - > Infrastructure Investment and Jobs Act (IIJA) and FRRM will replace 15% of FAA's air traffic control facilities
- FAA owns 618 radars with an average age of 36 years

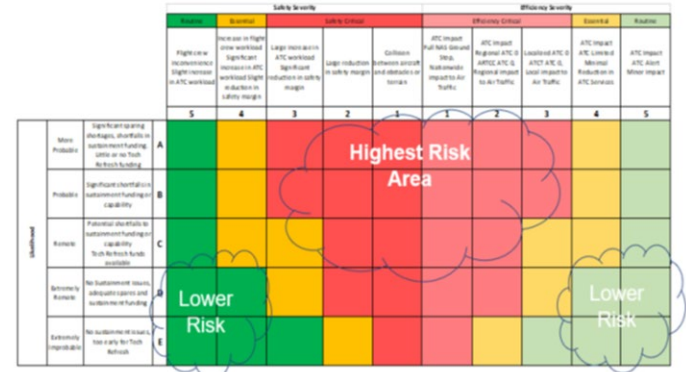
FRRM Proposal

- \$8.0 billion in mandatory funding over five fiscal years, funding:
 - > Replacement of 20-25 ATCT/TRACON facilities
 - > Recapitalization of 2 ARTCCs
 - > Modernization of up to 377 radars
- Build on the success of the Bipartisan Infrastructure Law (BIL)
 - > Leverage mandatory funding from the Airport and Airway Trust Fund



National Airspace System | Surveillance Criticality

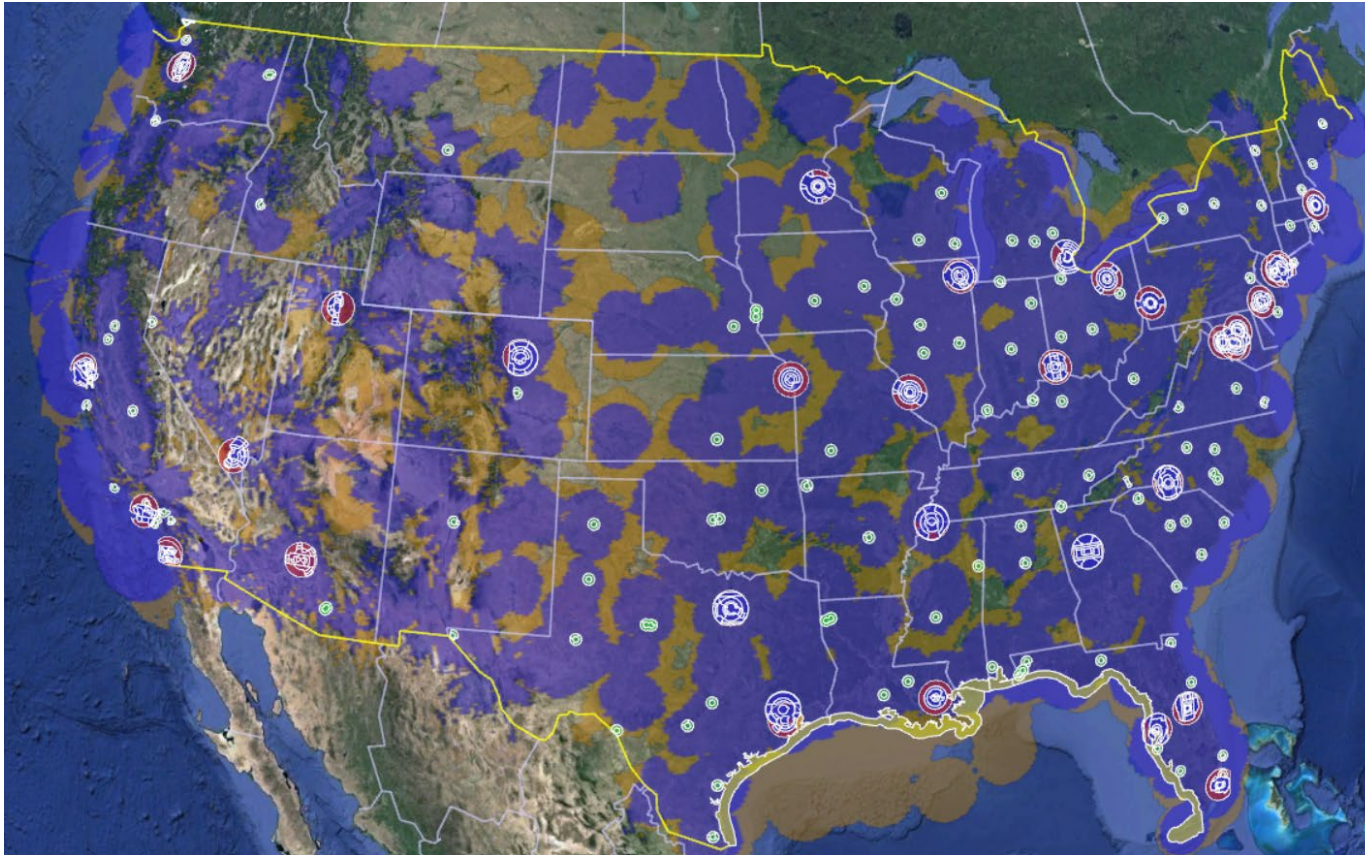
- Aging facilities and radars add risks to the system, including risk of service disruptions (delayed or cancelled flights)
- NORA was initiated to assess all operational NAS Systems likelihood of failure and severity of impact to Safety and Efficiency
 - > The **Highest Risk Area** identified Facilities and Cooperative and Non-cooperative Surveillance Systems
- NAS Safety Review Team (SRT) Report:
 - > "The age of the FAA's crucial air traffic control systems is so advanced, it makes any private sector comparison difficult."
 - > Insufficient Funding Levels, "Without more funding, the FAA will be unable to address these needs."



FRRM Strategy For Surveillance Radars

- The safety and efficiency of the national airspace system relies on:
 - > The condition of our facilities and equipment
 - > Redundancy
- Radars play a critical role in NAS operations
 - > ADS-B added a layer of surveillance with safety and efficiency benefits but did not eliminate radars
- This proposal includes funding the procurement and installation of up to 377 radars across the nation (60% percent of the radar portfolio by system count)
 - > Reduced sustainment cost through consolidation of many different systems
 - > Provides an opportunity for optimized surveillance services

Airspaces and Surveillance Coverage



ADS-B Equipage Required Airspace

ADS-B Equipage Required Airspace

Class B
Mode C Veil Up to 10,000'
Class C (and up to 10,000' above)
Class E along Gulf Coast (12 NM from coastline from 3,000' up to 10,000')
Class E over CONUS (10,000' up to 18,000')
Class A (18,000' up to 60,000')

Orange: 1,500'
ADS-B Coverage

Blue: 1,500'
Radar Coverage



NAC Subcommittee (SC) Chair Report

Jeffrey Winter, NAC Subcommittee Chair (JetBlue Airways)

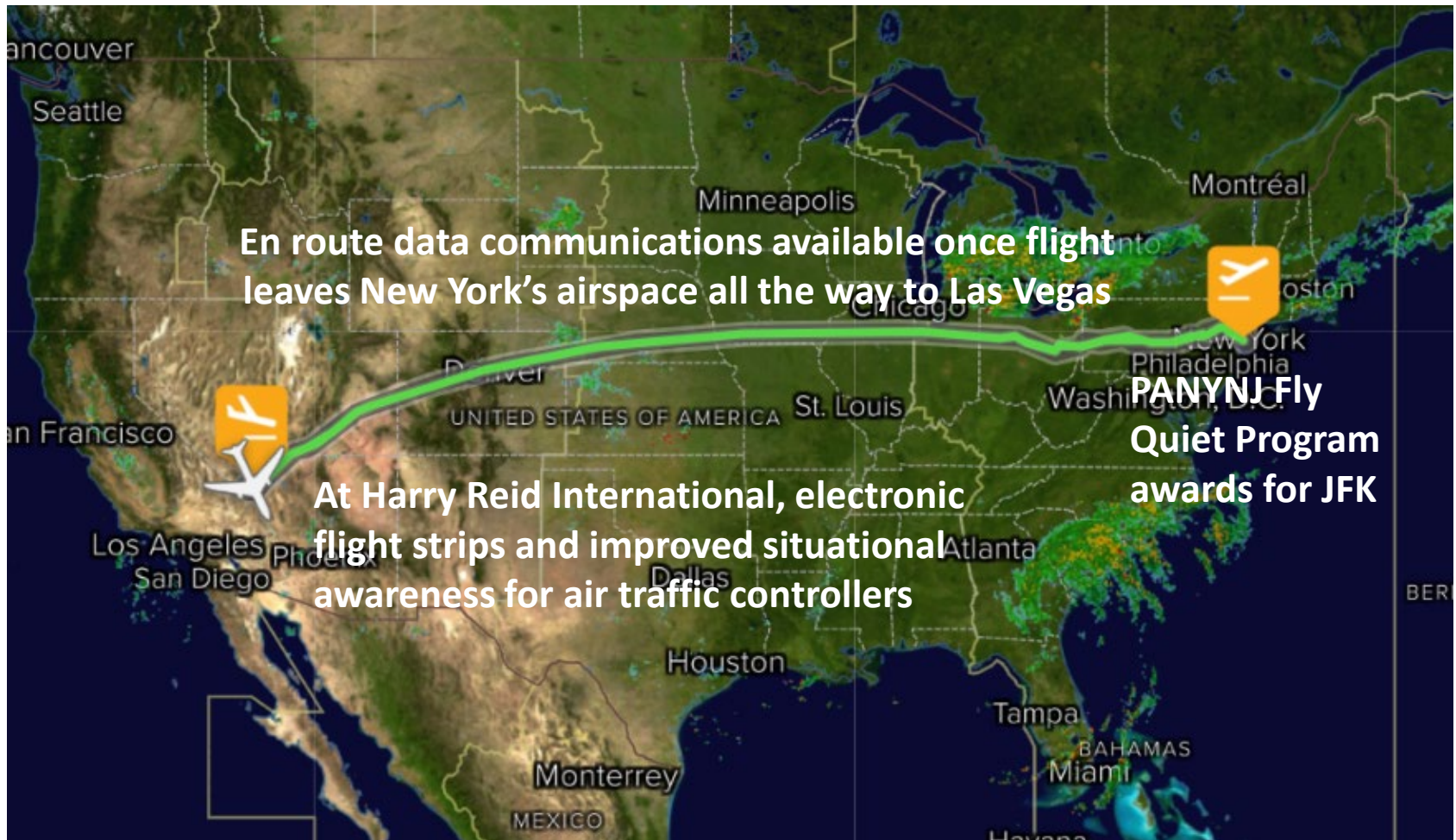
NAC Subcommittee Report Topics

- Today's NAC Subcommittee report will outline the team's key activities, highlighting work completed over the last five months, including:
 - > Tower controller situational awareness and airport data enhancements - readiness activities for Terminal Flight Data Manager
 - > En route data communications – operator status and update on benefits analysis for currently available services
 - > Steps being made to reduce reliance on legacy procedures – update on the findings from NAS Airspace Efficiencies workgroup



How are recently completed milestones contributing to operations?

An example using JetBlue JFK to LAS flight

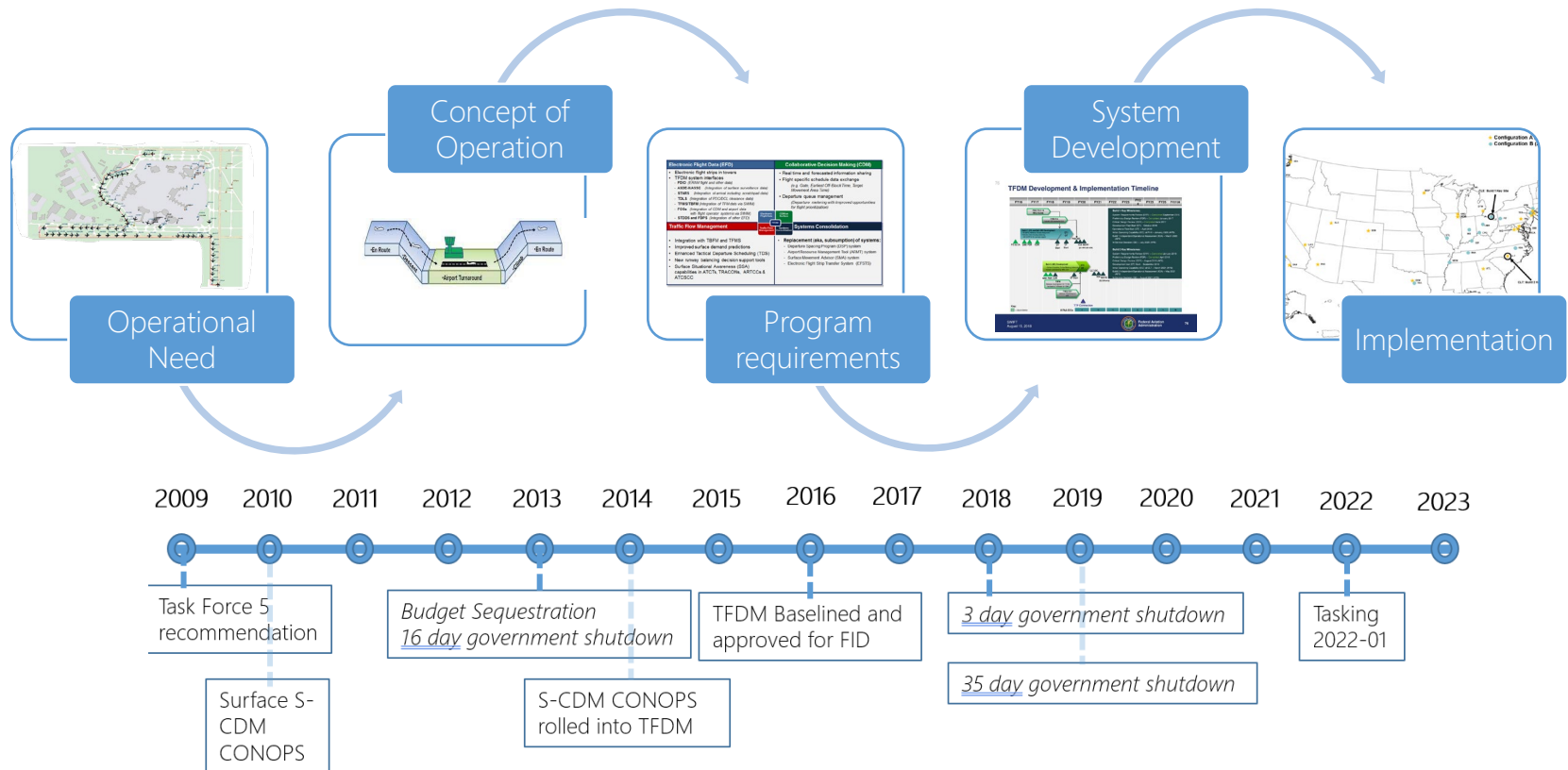




Terminal Flight Data Manager Program Update

Rob Goldman (Delta Air Lines) & Chris Oswald (ACI-NA)

Surface & Data Sharing Development Timeline



Setting the Stage for the Fall NAC Meeting

- Surface/Data Sharing NIWG continues its focus on way to enhance industry readiness for surface metering at the 27 airports where this capability will be available
- Areas of focus for readiness include:
 - > Roles and responsibilities of key stakeholders
 - > Policies and procedures
 - > Enabling technologies
- Also focusing on the benefits that TFDM provides beyond surface metering including at the 22 additional “non-surface metering” airports
 - > Reduced controller workload
 - > Improved surface management flexibility
 - > Improved flight operator and airport situational awareness
 - > Improved during- and after-event analytics, including those dealing with compliance
 - > Setting the foundation for information-centric NAS operations and trajectory-based operations
- Fall NIWG briefing will focus on our findings and recommendations in both areas





Data Communication NIWG Update

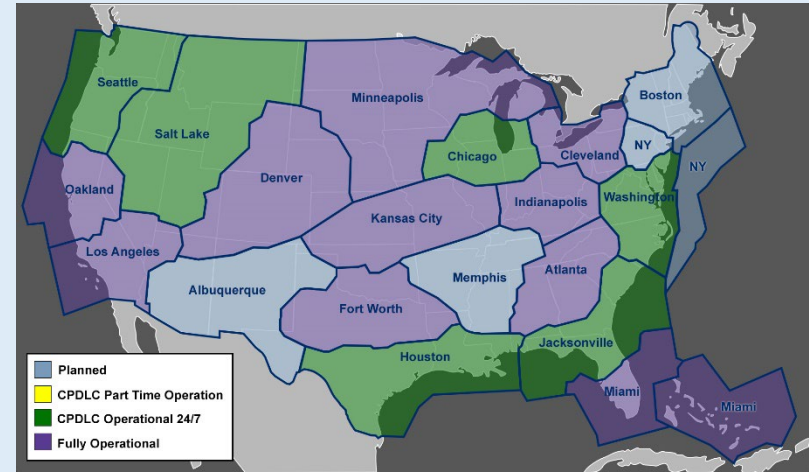
Chris Collings (L3Harris) & Ed Evans (Southwest Airlines)

Kathy Torrence (FAA)

Data Comm NIWG Update (August 2024)

En Route Data Comm Deployment

- + 16 centers operational 24/7
- + En Route Full Services Increment 1 active at all active centers
- + Planning En Route deployment to remaining 4 centers.
- + 10 centers declared IOC



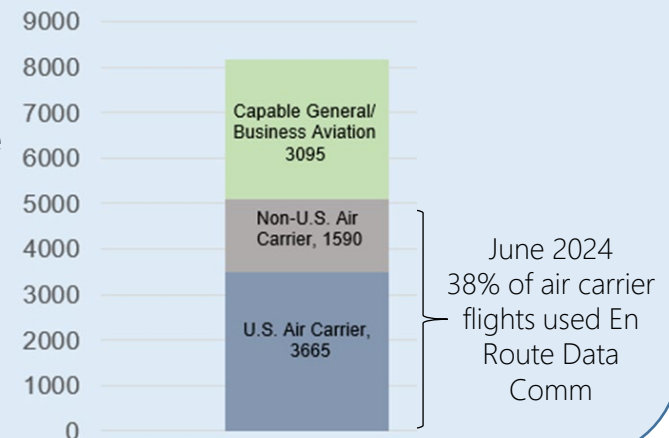
Upcoming Center Start Dates (Initial Testing):

Albuquerque: 26 Sep 2024 | Boston: 6 Nov 2024 | Memphis: Dec 2024 | New York: Feb 2025

Industry Updates

- + Over 38% of En Route air carrier traffic used Data Comm in June 2024
- + Installation of avionics updates 77% complete
- + Continue to receive positive user feedback as usage grows
- + GA/BA NOTAM lifted – revised En Route participation list published May 2024

Data Comm En Route Aircraft Equipage



Data Comm Equipped Capable Fleet

US Air Transport Operators	DCL Participating	En Route Participating
American Airlines	✓	✓
ABX Air	✓	✓
Amerijet International	✓	▲
Alaska Airlines	✓	✓
Air Transport International	✓	✓
Kalitta Air	✓	✓
Delta Air Lines	✓	✓
Eastern Airlines	✓	▲
FedEx	✓	✓
Atlas Air	✓	▲
Hawaiian Airlines	✓	▲
JetBlue	✓	✓
National Air Cargo Group	✓	✓
Spirit Airlines	✓	▲
Omni Air	✓	▲
Polar Air Cargo	✓	▲
Republic Airways	Initial ops with select crews and aircraft	
Southwest Airlines	✓	✓
United Airlines	✓	✓
UPS	✓	✓
Western Global Airlines	✓	▲
Business Aviation Fleet Size	4,619	3,095
Non-US Air Transport Operators	74	38

Key
 Participating ✓
 Future User ▲





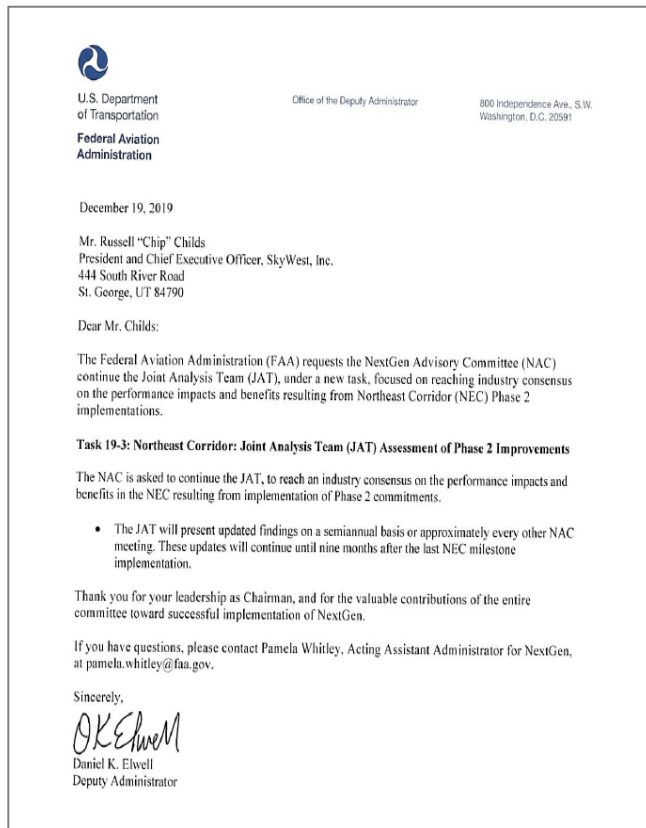
NAC Task 23-3: Joint Analysis Team: En Route Data Comm Update

Eric Silverman (American Airlines) & Alex Burnett (United Airlines)

Dave Knorr (FAA) & Kathy Torrence (FAA)

Two Active JAT Taskings

Main focus through 2024 spring/early summer has been Enroute Data Comm



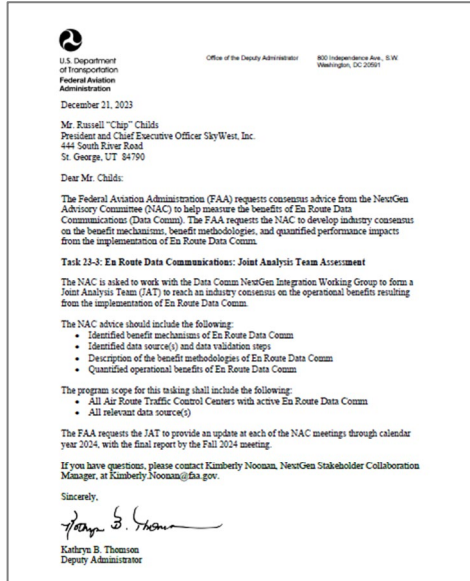
We all believe in en route Data Comm benefits



- Agree with the underlying benefit tenets
- But quantifying the benefits is complex (qualitative easier than quantitative)

- Similar but different from tower data comm
- Still early in the Data Comm program
 - Ongoing issues continue to be worked between FAA/industry
 - En Route Full Services beginning deployment
 - Additional complexity on measurement

Looking at two approaches to quantifying benefits



Big Data Approach (L3Harris)

- Similar to Tower Benefits in comparing transaction times (flights with data comm re-route versus those with voice)
- Expect signal to increase with more Data Comm ARTCC implementation, full services, and more flights + once ongoing issues are resolved
- To include comparisons at the city pair level
- May need more tweaks for consensus agreement on metrics, data sources, and methodology

Scenario Based Analyses

- Identify and build out examples of that illustrate direct operational benefits – e.g., space launch/convective WX/military-SUA airspace



Working through data contributing to quantified benefits

Statistically-based efficiency analysis is complex

Throughput/Efficiency



- Delay
- Fuel Burn

Controller Pilot/Efficiency



- Communication Time
- Controller Workload

Environmental



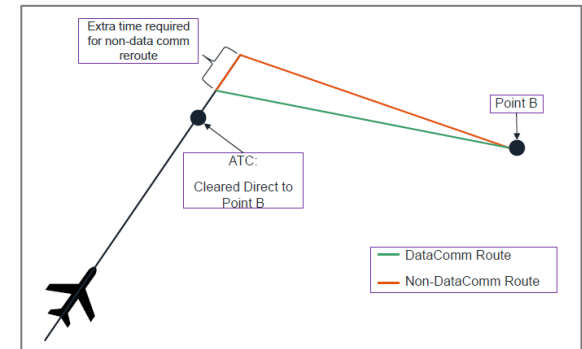
- Emissions (CO₂)

Safety



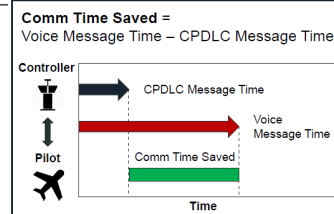
- Read/hear back errors
- Loss of Comm events

- Estimates small savings from faster transition from current to new route
- Small percentage of flight time/distance
- Often unrelated to the “efficiency” of the reroute



Error rate and time saved may be more straightforward

Complexity and Error Rate Estimates	
Complexity	Error Rate
1	0.00%
2	4.08%
3	5.83%



1,038,875 readback errors mitigated



3,924,215 minutes of comm time saved



Next Steps for Task 23-3 (En Route Data Comm)

- Continue deliberations to reach consensus approach to measuring operational impact of en route data communications
 - > Additional follow up on the statistical-based benefits calculations
 - > Explore complementary methodologies, scenarios and illustrative examples
 - Build out more direct operational benefits – e.g., space launch/weather
 - Provide interim analysis for Fall 2024 and highlight opportunities for value from a future secondary analysis
 - > Potential Industry led pilot survey through A4A Ops Council in August
 - Gain insights on what industry pilots are experiencing – may be a more qualitative look



NAC Task 23-2: NAS Airspace Efficiencies Update

Lee Brown (JetBlue Airways) & Ron Renk (United Airlines)

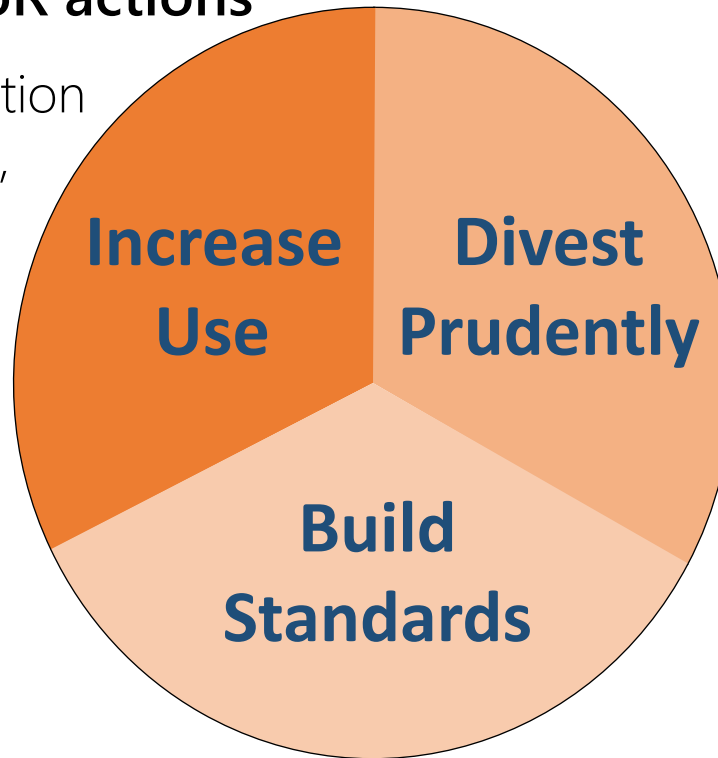
Greg Schwab (FAA) & Chris Southerland (FAA)

Plan for Addressing Task Elements

Coordinate EoR actions

Track RNP utilization

Review “barriers”
reports and
status actions



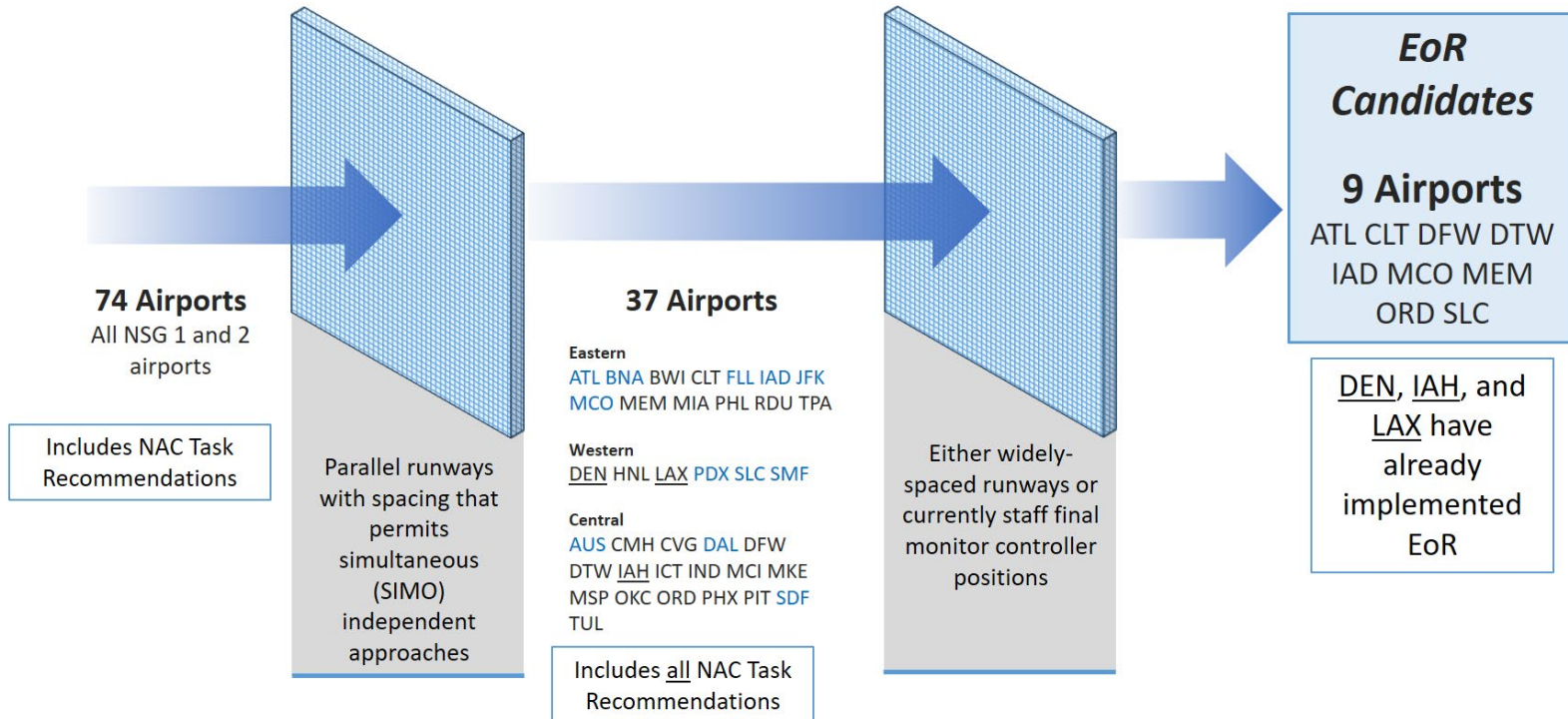
Align with FAA IFP
streamlining
efforts

**Complete
additional
case studies**

Expand Minimum
Service Level (MSL) definitions and
compare with completed case studies

Considering Expansion of EoR Sites

EoR Candidate Airport Identification



Additional Case Studies

Examining other airports will harden divestiture process and MSL recommendations

Category

- Military use: **HNL, VPS**
- NSG 3/4: **HUT, PVD**
- NSG 1/2: **DEN, DTW**
- NY area: **JFK, LGA, EWR, TEB, HPN, MMU, SWF, FRG, ISP**

Selection Logic

- Look at operations that include heavy number of military flights
- Sample general aviation operations and equipage
- Examine a full NSG 1 airport along with NSG 2 hub
- Consider a large network of airports; varying equipage and PBN procedure inventories

NSG 3&4 Airport Case Studies (HUT & PVD)

Procedures will continue to be reviewed through the established IAP periodic review process. As part of that review process, the FAA should consider the following assumptions, lessons learned, and criteria:

- Underlying assumptions
 - These criteria may need to be applied to all airports, regardless of NSG level
 - Low utilization does not equal no need
- Lessons learned
 - The end state may differ from the initial impression
 - Robust coordination will be required between FAA, state and local stakeholders, and pilot communities

NSG 3&4 Airport Case Studies

Criteria

1. Is this the only IAP at the airport?
2. Is this airport susceptible to unusual weather conditions?
3. Are there specific flight training considerations? What is the closest alternative procedure for training purposes?
4. Are there commercial operating requirements - do OPSPECS or SOPs stipulate precision or vertical guidance?
5. Is this procedure a designated MON airport procedure? (VOR or ILS)
6. Will removal eliminate lowest landing minima to an individual runway?
7. Does this procedure exist because of high terrain or an obstacle that makes a straight-in procedure unfeasible or which would result in the straight-in minimums being higher than the circling minima?
8. Is this circling-only procedure (1) at an airport where not all runway ends have a straight-in IAP, and (2) does it have a Final Approach Course not aligned within 45 degrees of a runway which has a straight-in IAP?

Note: criteria 1-4 were added to earlier NPA criteria



NSG 3&4 Airport Case Studies

Name	HUTCHISON KANSAS	Data Source
ICAO Code	KHUT	
Nav Service Group	4 - Minimum Capabilities - ILS, RNP APCH, VOR, NDB	FAA
MON AIRPORT	NO	

Runway	Length (LDA)	Lighting Aids	Procedure Title	RNP APCH REQ	ILS or LPV Minima (SM - HAT)	LNAV/VNAV Minima (SM - HAT)	LNAV or S/I Minima (SM - HAT)	Utilization Rate	In Compliance With Current TERPS Criteria	In Compliance With Current Airport Design Std	For Noise Abatement
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Federal Aviation Administration

Procedure Usage and Equipage

Runway 4

KHUT

Please click on the arrow to select airport

Federal Aviation Administration

Procedure Usage and Equipage

KPVD

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PROCEDURE USAGE

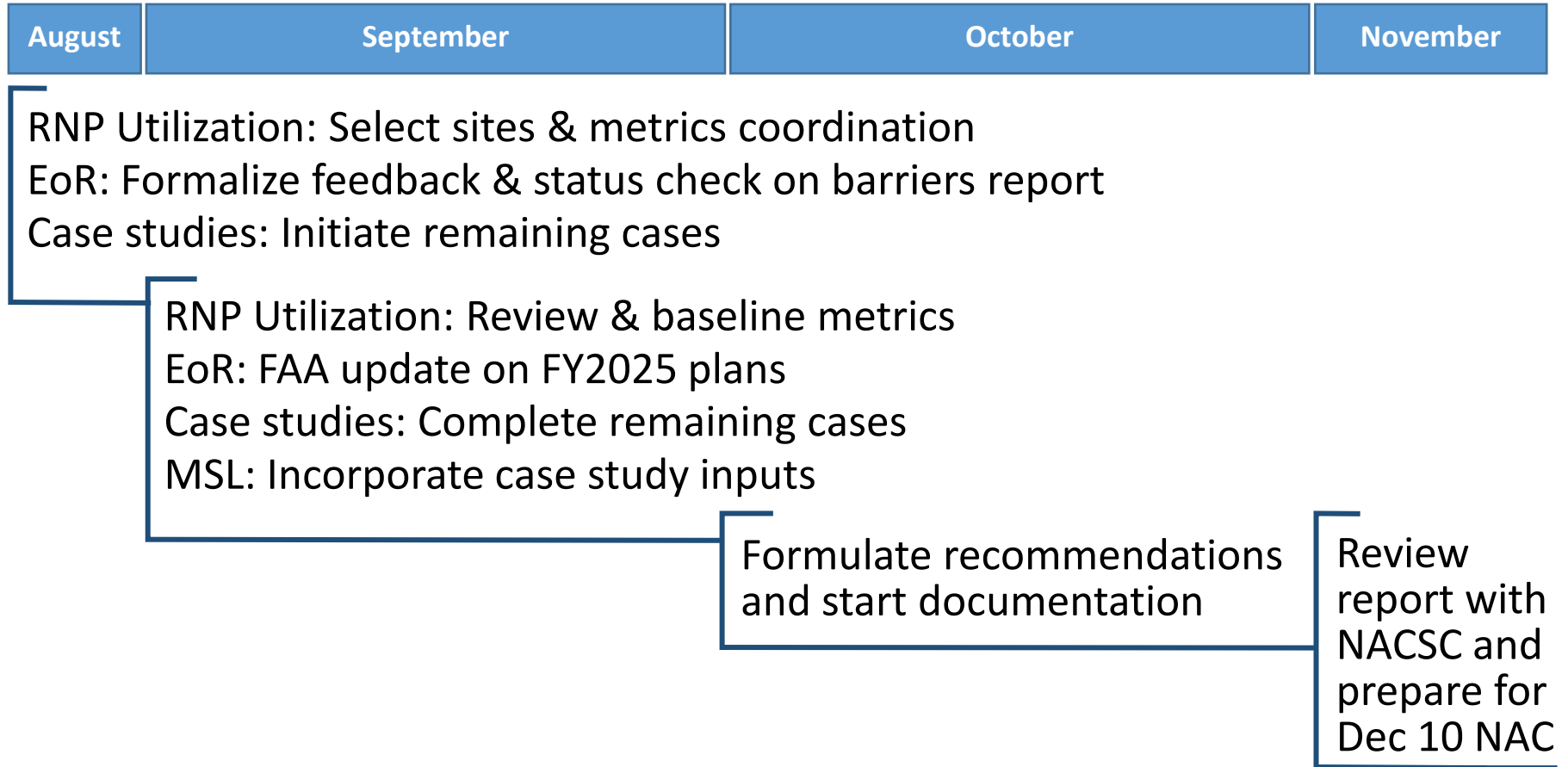
EQUIPAGE

Carrier	Procedure Operations	Procedure Count	Aircraft Type
SWA 4,002	STAR 15,810	STAR 2	B737 2,239
MXV 1,541	APPROACH 609	APPROACH 12	A320 1,847
JIA 1,517	Grand Total 16,419	Grand Total 14	B738 1,192
AAL 1,237			BCS3 1,095
DAL 1,163			CRJ9 1,024
GA 877			CRJ7 1,022
JBU 812			E145 836
RPA 708			B38M 770
PDT 542			A321 674
ENY 450			A319 623
EDV 316			E170 587
UCA 276			E75L 483
EJA 270			E195 411
AAY 251			B752 364
UPS 242			E75S 297
GJS 163			B712 256
UAL 157			C56X 181
ASH 152			C750 156
FDX 121			F2TH 148
SKW 107			E190 142
LXJ 96			C68A 121
JRE 57			E55P 105
HRT 53			CL35 81
SCX 49			G280 76
SHH 46			GLF4 74
EJM 35			H25B 62
FTH 29			C700 56

Aircraft Type



Schedule to December Deliverables





Review of Action Items & Other Business

Kimberly Noonan, NAC Committee Manager (FAA)



Closing Comments & Adjourn

Chip Childs, NAC Chair

President & CEO (SkyWest Airlines)