NAC Meeting

March 28, 2022

Opening of Meeting

Chip Childs, NAC Chairman

President & CEO, SkyWest, Inc.

Public Meeting Announcement

NextGen Advisory Committee (NAC)

March 28, 2022

Public Statements

Members of the Public

Chairman's Report

Chip Childs, NAC Chairman

President & CEO, SkyWest, Inc.

Motion for NAC Approval

October 19, 2021 – NAC Meeting Summary Package Draft

State of Industry Update

Chip Childs, NAC Chairman

President & CEO, SkyWest, Inc.

Industry Forum on Community Engagement Update

Brad Pierce (N.O.I.S.E.)

Industry Forum on Community Engagement

Objective: Identify best practices AND touch points On how the NAC can encourage broader aviation industry participation in the FAA's existing community engagement structure.

Industry Forum on Community Engagement (cont.)

Team: NAC Member and designated NAC SC Member Representative volunteers self-identifying as interested in participating in this industry-only forum.

- N.O.I.S.E.
- JetBlue
- Delta
- Southwest
- PASS
- Airbus
- Boeing
- Port Authority of New York and New Jersey (PANYNJ)
- NATCA
- ATCA
- Honeywell

FAA Report

Brad Mims, FAA Deputy Administrator

NAC Designated Federal Officer

FAA Report

Steve Dickson, FAA Administrator

FAA Report

Paul Fontaine, Acting Assistant Administrator for NextGen

FAA Report

Tim Arel, Acting ATO Chief Operating Officer

State of the NAS

An Opportunity to Re-synchronize Our Collective Understanding of the NAS with Our Stakeholders

FAA
Air Traffic Organization

Overview

- Emerging from COVID-19
- Impacts – modernization – we have a math problem
  - Operations
  - Training
  - Programs
- Leverage Stakeholder Collaboration

NAS Operations

- Airlines are reporting at ~88% Pre-COVID
- NAS is operating at 95% Pre-COVID
- Portions of the aviation community operating well above Pre-COVID levels
  - Regions vary – Florida, California and Ski Country
  - General Aviation - especially business aircraft
  - Special Event (e.g., Super Bowl, NASCAR, Snow Birds, etc.)
  - Cargo
- Aviation Challenges to Returning to Pre-COVID levels
  - Oil Prices
  - Crew Availability
  - Return of International Travel

Feb 2022 NAS Traffic Level Summary

IFR Traffic

Category	Percent Change
Total IFR	-7%
Freight	4%
GA	12%
AC + AT	-11%
International	-23%

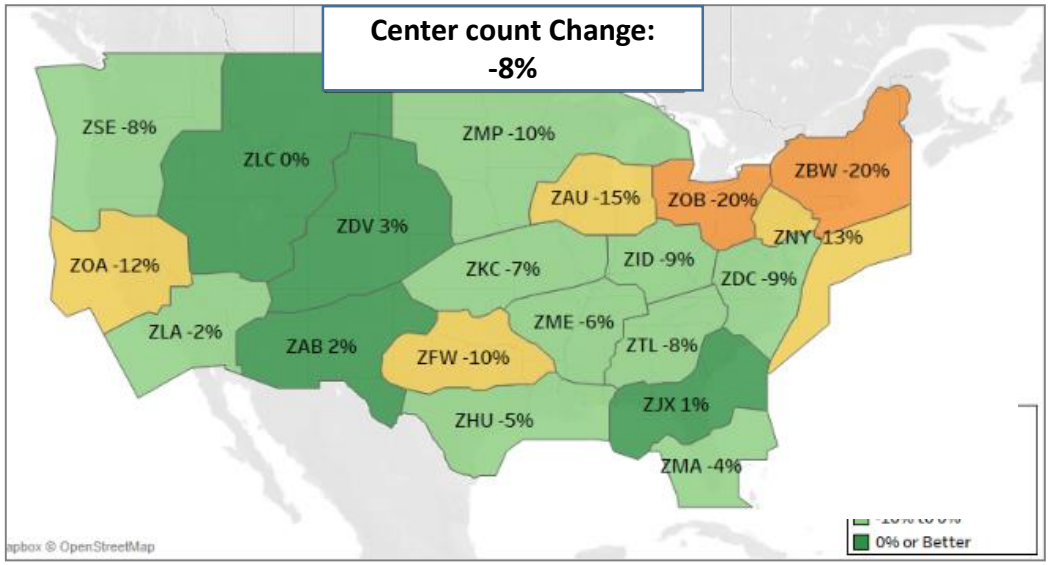
TSA	-16%

523 OPSNET Airports:

- 290 at or above baseline
- 387 greater than 90%

Baselines: 2017-19

Ski country
Florida
California



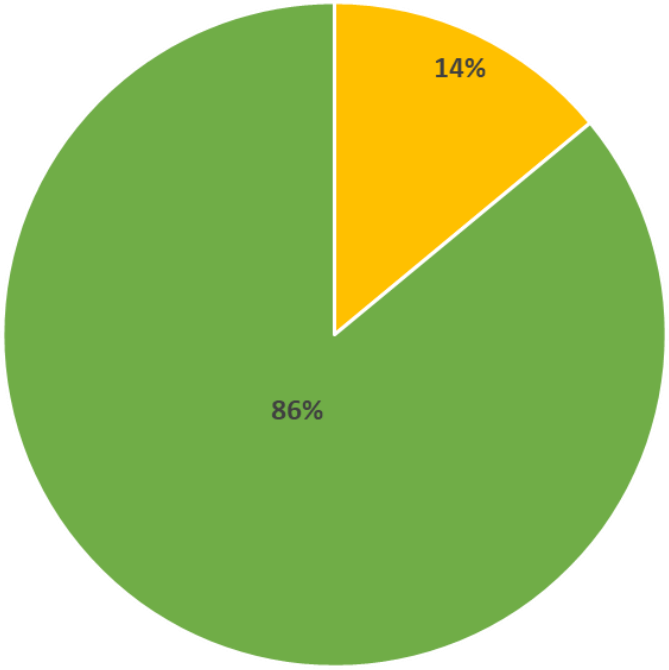
BJC	172%
PRC	147%
MYF	143%
LGB	136%
EGE	134%
CRG	124%
PBI	129%
AUS	123%
ASE	123%
VNY	138%
BNA	112%
SNA	110%
MIA	111%
FXE	107%
APA	108%
FFZ	105%
TPA	106%
LAS	102%
DEN	103%
IWA	100%
MCO	100%

Staffing & Training

- COVID impacts due to the 8 month pause in training
  - Certified CPC number decreased by 205 pre-COVID number
  - OS staffing decreased by 57 from March 2020 to March 2022
- ATCS hiring continued and goals met
  - Solution is OJT
- Training has resumed at all 313 facilities with no restrictions at this time
- Keeping up with attrition
  - Focus on increased certification rates with increased OJT
  - National Training Initiative focused on training minimums
    - 3,127 average hours of OJT per day in March of 2020
    - 2,578 average hours of OJT per day in March of 2022

F&E Overview

- Near-term Capital Improvement Plan (CIP) amounts are projected to be flat
- Only 14% of average annual budget is New Functionality
- Since FY20, we've been absorbing COVID impacts, which currently total $270M+



14% Pre/Post-Implementation
86% Mandatory Budget

Conclusion

- **Ops**
  - NAS is operating near historic average levels
    - Return of international travel will push us into new highs
- **Air Traffic Training**
  - Back at full capacity:
    - Need to incorporate new controller tool training and system upgrades
    - Ensure certifications keep pace
- **Programs**
  - Math problem
    - Stakeholder engagement critical to understanding aviation community priorities

FAA Report

Chris Rocheleau, Deputy Associate Administrator for Aviation Safety

FAA Report

Di Reimold; Deputy Director, Strategic Initiatives for Policy and Innovation

Chairman's Roundtable

Chip Childs, NAC Chairman

President & CEO, SkyWest, Inc.

Minimum Capabilities List (MCL) Discussion

Ron Renk (United Airlines)

Resiliency

- Definition of resiliency for MCL purposes – ***continuity of operations.***

- Radio Frequency Interference (RFI) concerns:
  - Radar Altimeters (5G)
  - GPS (Ligado, DoD testing, Personal Protection Devices)

- The billion dollar (literally) question we should be thinking about is who is responsible for resiliency and is it appropriate for the MCL?

How Did MCL Predict The 5G Problem?

- As MCL drives equipage requirements for forward fit, we must ensure value for the operator expense.

- Industry technical experts constantly monitor threats to the continuity of operations in the NAS.

Current Resiliency Concerns Spectrum Related

- While frequency spectrum is not the only threat to the resiliency of NextGen, today's threats are related.
- Current FCC process looks at transmit vs receive.
- Power levels of adjacent frequencies relevant in both GPS and 5G.
- December 2021, RTCA established a new special committee, SC-242, to take a broader look at potential frequency spectrum conflicts.
  - Analyze the existing standards in place for avionics.
  - Identify those areas that need to be addressed so that aviation interests can be out in front of any potential frequency conflicts early on in future technology development.

Does Radar Altimeter Need to be on MCL?

- RTCA SC-239 working to update the minimum operational performance standards for radar altimeters, RTCA DO-155/EUROCAE ED-30, to produce a new harmonized document for use in a FAA technical standard order (TSO) revision.
  - Scheduled to be published in December 2022.

- Avionics OEMs will likely produce updated avionics and Aircraft OEMs will equip more robust Radar Altimeters.

- MCL requirement would likely be redundant in this case but still may serve a purpose.

Round Table Discussion Topics

- Is it appropriate for the Minimum Capabilities List team to work resiliency?
  - Example Pros – ensures continuity of ops for NextGen equipage, provides some early warning.
  - Example Cons – non-NextGen equipage listed on MCL Matrix.

- How do we prevent future conflicts?
  - Proactive vs reactive.
  - Aviation has long lead times for "fixes".

- Lessons Learned?
  - How do we get garner collaboration to solve issues between spectrum stakeholders?

FAA Topics

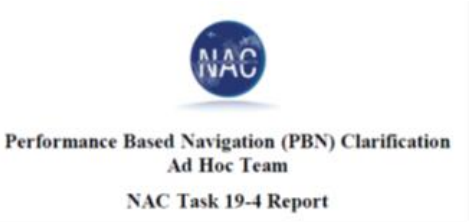
FAA

Airspace Modernization Roadmap Update

Jim Arrighi (FAA)

Airspace Modernization Roadmap Update

- AMR briefed to the NAC on October 19
  - November 4 Industry Day briefing
- Shifting from tactical to strategic:
  - Resource Deployment aligned with National Strategy
  - Proactive Communication and Engagement
- Service Area Leadership Team (SALT) stand-up meetings in March
- SALT assessment of initial sites for portfolio development in April
- Airport Portfolios under development – NSG 1 & 2 airports
  - Metrics based on quantitative and qualitative analysis
- FAA internal deliverables per Service Area by EOFY
  - 2 AMR project recommendations per service area



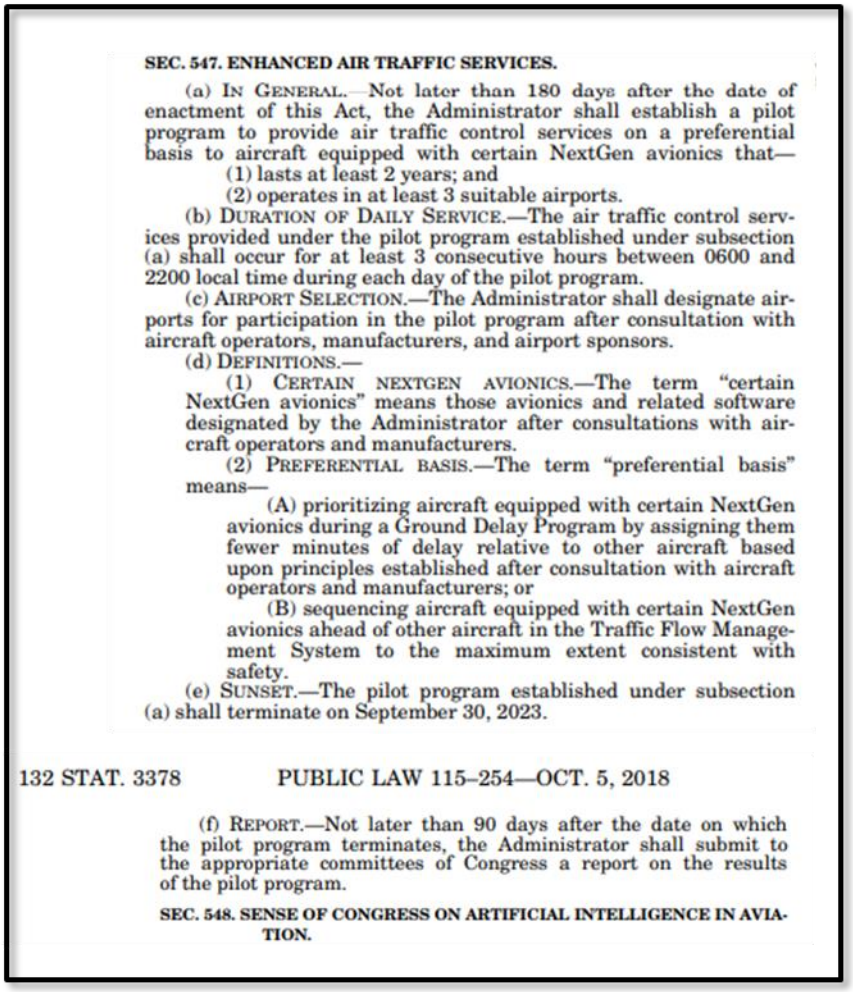
Section 547 Update

Juan Narvid (FAA)

Context: Summary of Section 547 Initiatives

Section 547 of the FAA Reauthorization Act of 2018 requires FAA to establish a pilot program to provide air traffic control services on a preferential basis to aircraft equipped with certain NextGen avionics which:

- Started September 30, 2021 and continues for two years thereafter (must be complete by September 30, 2023)
- Operates in at least three suitable airports
- Occurs for at least three consecutive hours daily between 0600-2200 local time



SEC. 547. ENHANCED AIR TRAFFIC SERVICES.

(a) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Administrator shall establish a pilot program to provide air traffic control services on a preferential basis to aircraft equipped with certain NextGen avionics that—
(1) lasts at least 2 years; and
(2) operates in at least 3 suitable airports.

(b) DURATION OF DAILY SERVICE.—The air traffic control services provided under the pilot program established under subsection (a) shall occur for at least 3 consecutive hours between 0600 and 2200 local time during each day of the pilot program.

(c) AIRPORT SELECTION.—The Administrator shall designate airports for participation in the pilot program after consultation with aircraft operators, manufacturers, and airport sponsors.

(d) DEFINITIONS.—
(1) CERTAIN NEXTGEN AVIONICS.—The term "certain NextGen avionics" means those avionics and related software designated by the Administrator after consultations with aircraft operators and manufacturers.
(2) PREFERENTIAL BASIS.—The term "preferential basis" means—
(A) prioritizing aircraft equipped with certain NextGen avionics during a Ground Delay Program by assigning them fewer minutes of delay relative to other aircraft based upon principles established after consultation with aircraft operators and manufacturers; or
(B) sequencing aircraft equipped with certain NextGen avionics ahead of other aircraft in the Traffic Flow Management System to the maximum extent consistent with safety.

(e) SUNSET.—The pilot program established under subsection (a) shall terminate on September 30, 2023.

132 STAT. 3378 PUBLIC LAW 115–254—OCT. 5, 2018

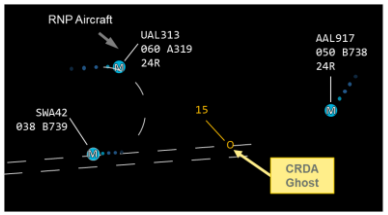
(f) REPORT.—Not later than 90 days after the date on which the pilot program terminates, the Administrator shall submit to the appropriate committees of Congress a report on the results of the pilot program.

SEC. 548. SENSE OF CONGRESS ON ARTIFICIAL INTELLIGENCE IN AVIATION.

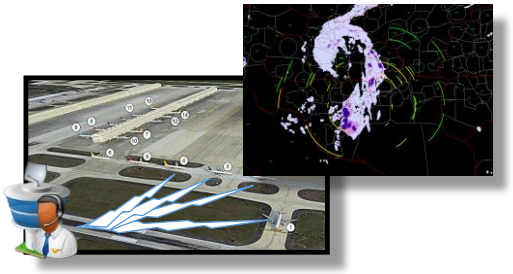
Overview of Selected Section 547 Initiatives

Process: Industry provided FAA a 'short list' of candidate recommendations based on Readiness, Return, & Relevance

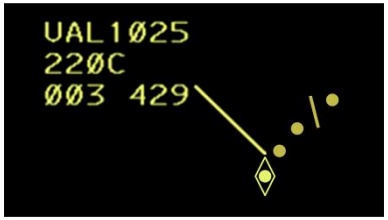
Initiative
Simultaneous Independent Established on RNP (EoR) at Los Angeles International Airport (LAX) *(start date: September 12, 2021)*
CPDLC Departure Clearance (DCL) capabilities at Orlando International Airport (MCO) *(Focused metric tracking September 1, 2021)*
Automatic Dependent Surveillance-Broadcast (ADS-B) Out enabling 3 nautical mile (NM) in en route airspace (below FL230) for Oakland Air Route Traffic Control Center (ZOA) *(start date: September 9, 2021)*



PBN RNP Equipage= Reduced Flight Distance and Flight Time



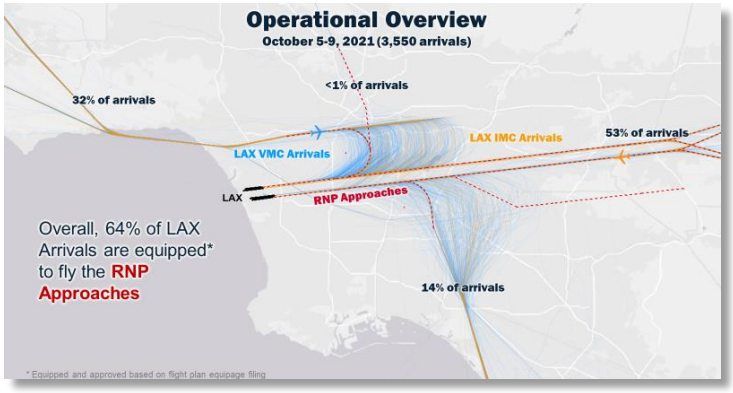
Data Communication Equipage= Earlier Departure During Rerouting Events, and overall system efficiency



ADS-B Out Equipage= Reduced spacing/distance flown

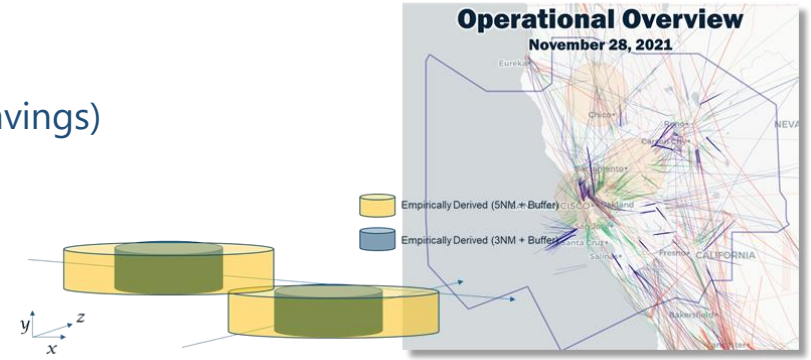
Section 547 Initiative Status

- Positive feedback received from workforce on initiatives
- Operational data being assessed for benefits and metrics discussions are on-going



> LAX Initiative
  - **Distance and Time Savings**
  - **Throughput**

> MCO Initiative
  - **Airspace User Time Saved** (gate and taxi delay savings)
  - **Kgs of C02 Emissions Prevented**



> ZOA Initiative
  - **Eliminated Conflicts**
  - **More Efficient Maneuvers** (to resolve remaining conflicts)

Electric Propulsion

Operations in the NextGen ATM Airspace

Chris Hope (FAA)

Electric Engine Development

- **Electric Engine Certification Approaches**
  - Standalone Type Certificates for Electric Aircraft Engines
  - Electric Engine Approvals under Aircraft Type Certificate
  - Retrofit by STC or Installation to New Aircraft Designs

- **Electric Engine Types**
  - All-Electric (electric engine + battery systems)
  - Hybrid-Electric Propulsion (electric engine + electric power generation via combustion engine or hydrogen fuel cell technology)

- **Electric Engine Installations**
  - All-Electric or Hybrid-Electric Propulsion for existing airframes and new aircraft type designs
  - Initial operations in part 135, then part 121 operations as technology matures

NextGen Flight Technology and Procedure Implementation

- **Electric propulsion enables flexible design opportunities**
- **FAA developing flight standards and procedures to advance electric aircraft utilization**
  - Part 135/121 flight operations
    - Piloted
    - Existing certification
    - Passenger / cargo
    - Scheduled
  - Airspace and airports
  - Research and analysis

Electric Propulsion Introduction - Path to Success

- **Viable option for existing Part 135 and 121 regulatory and airspace structure**
  - Integration of EP into new and existing airframes viewed as viable
  - Aircraft performance should meet current levels for seamless integration
  - Electric energy source(s) should meet current levels of safety provided by existing endurance requirements
  - Some airworthiness and operation standards will require further evaluation
  - Is it a turboprop, turbine engine for operational regulatory purposes?
  - Target is seamless integration into current route structure
- **Modernization of air terminal infrastructure requirements**
  - Introduction of EP will require updating of existing air terminal facilities in order to incorporate a network of charging stations and supporting infrastructure
- **AAM small air taxi operations**
  - Will require further study and regulatory change in order to integrate due to a different set of challenges

NAC Subcommittee (SC) Chairman's Report

John Ladner, NAC SC Chairman (Alaska Airlines)

21-1: Minimum Capabilities List (MCL) Update

Ron Renk (United Airlines)

Meetings Resumed in February

- Started with a quick review to level-set new members of the team
- Dug right into a benefits discussion on better ways to support adoption of MCL Baseline Capabilities
  - Create a helpful framework to instill confidence in ROI
  - Instead of providing only $$ figures for benefits, we'd like to consider providing the formulas for individual operators to be able to insert their own numbers* for tailored analysis
- Discussed new technologies that may need to be moved from supplemental to baseline or added to supplemental

***** Number of: operations, equipped aircraft, negotiated costs, etc.

Conclusion

- MCL team is off to a good start with lots of work ahead
  - Meeting cadence to be roughly two hours, every two weeks, through late summer

- Likely order of work:
  - Benefits Update
  - Changes in Scope
  - Assumptions that Need Re-Evaluation
  - Refresher of Available Technology
  - Recommendations to Drive Further Adoption

Northeast Corridor (NEC)

Aaron Wilkins (FAA), Juan Narvid (FAA), & Wendy O'Connor (FAA)

Ralph Tamburro (PANYNJ) & Lee Brown (JetBlue)

Northeast Corridor Focus Areas

- Advancing NAC-recommended "NextGen Opportunities" toward regular operational use
  - Public LGA Runway 31 GPS RNAV Approach on March 24th

- Completing milestones and operationalizing commitments
  - Improved airspace efficiency with Atlantic Coast Routes by Q4 2022
  - Improved access with GBAS at JFK & LGA starting in Q1 2023
  - Improved flow efficiency with time-based metering for PHL and EWR by Q4 2024

- Understanding and contributing to initiatives connected with the NEC
  - Other relevant TBO implementations
  - NEC VOR MON efforts
  - MARS and dependent EoR safety studies
  - PANYNJ Part 150 studies and Fly Quiet Program

Outlook for Commitments

Type	Commitment/Milestone	Jun 2021 NAC	Oct 2021 NAC	Current Dates
Implementation*	Improved departure management for flights destined for LGA	TBD	TBD	complete
Implementation*	DSP enhancements	Q4 CY2021	Q4 CY2021	complete
Implementation*	Atlantic Coast Routes	TBD	Q4 CY2022	Q4 CY2022
Implementation*	PDRR/ABRR Enhancements	Q4 CY2021	Q4 CY2021	complete
Implementation*	Arrival time-based metering (TBFM) for PHL and EWR	Q4 CY2023	Q4 CY2023	Q4 CY2024
Industry	GBAS installation start at LGA	Q1 CY2023	Q1 CY2023	Q1 CY2023
Industry	GBAS installation start at JFK	Q1 CY2023	Q1 CY2023	Q1 CY2023
Industry	Evaluate multi-route TOS	Q4 CY2021	Q4 CY2021	complete
Industry	Additional tower space for TFDM at BOS**	TBD	TBD	TBD

* Implementation and milestones are jointly shared by FAA and Industry for the NEC efforts

** Dependent on TFDM implementation waterfall adjustment (estimate June 2026)

Multiple Runway Operations (MRO)

Natee Wongsangpaiboon (FAA) & Raul Zamora, Jr. (FAA)

Phil Santos (FedEx) & Scott Dehart (Southwest Airlines)

MRO Milestones Updates (since October 2021 NAC)

Accomplishments:

- Completed the Consolidated Wake Turbulence (CWT) standards conversion at the last two sites;
  - N90/EWR – completed on 11/9/2021
  - D01/DEN – completed on 2/10/2022

- All MRO milestones for the current JIP have been completed

Surface & Data Sharing

Doug Swol (FAA) & Ayaz Kagzi (FAA)

Rob Goldman (Delta Air Lines)

Surface & Data Sharing – Current Activities

- **Terminal Flight Data Manager (TFDM) program**
  - Essential component of trajectory Based Operations (TBO)
  - Supports improved throughput, reduced fuel burn, reduced emissions & sustainability goals
  - Builds on an info-centric NAS that leverages data exchange to integrate systems and users

- **Industry Alignment with TFDM Waterfall**
  - Front Load Config A implementations in current Config B slots
    - Departure metering can be activated when airport community ready
    - Understand staffing capabilities
  - Conduct regular interval reviews to seek opportunities to condense overall waterfall and reorder as needed
  - Move all NYC airports (PHL, EWR, LGA, JFK, TEB, HPN) to Fall/Winter 2025
    - System integration (i.e. DSP) is a NY priority
    - Do not move TFDM implementation as a result of EWR → PHL airspace changes
    - Do not move TBFM (PHL, EWR, LGA) implementation as a result of EWR-PHL airspace changes

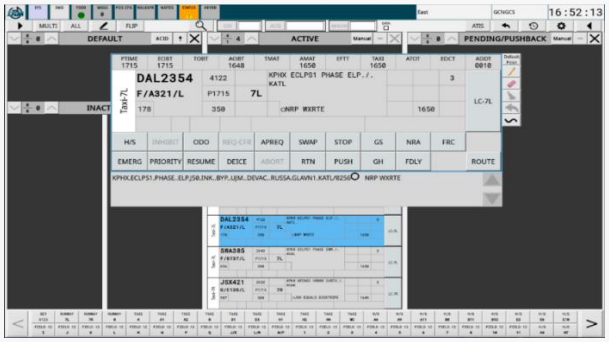
Surface & Data Sharing – Current Activities (cont.)

- **Next steps**
  - Continue to collaborate with TFDM program
  - Leverage SWIFT, NASA and other organization engagements
  - Seek new opportunities that promote data exchange, NAS connectivity and shared goals of throughput efficiency and sustainability

TFDM Program Overview

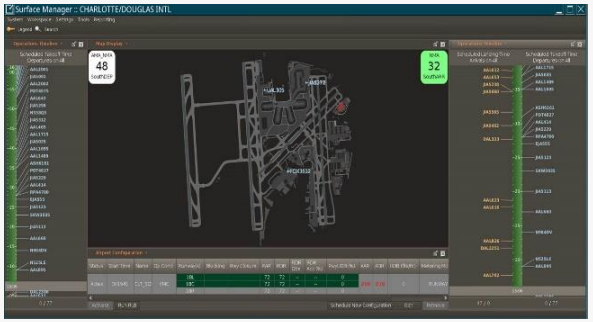
Electronic Flight Data (EFD)

TFDM will provide an improved Electronic Flight Data (EFD) exchange and Electronic Flight Strips (EFS) in the tower to replace printed flight strips. This functionality will be integrated with Flight Plans for automatic updating.



Collaborative Decision Making for the Surface (S-CDM)

TFDM will provide a departure scheduler with live data provided by Air Traffic systems/controllers and Flight Service Providers. The system will provide a departure metering capability, runway balancing and other surface management tools, improving surface traffic flow management.



Traffic Flow Management (TFM)

TFDM will enhance the traffic flow management data integration with Time Based Flow Management (TBFM) and Traffic Flow Management System (TFMS) to enable airlines, controllers and airports to share and exchange real-time data. This will result in improved surface traffic management as well as improve the products produced by TFMS and TBFM.

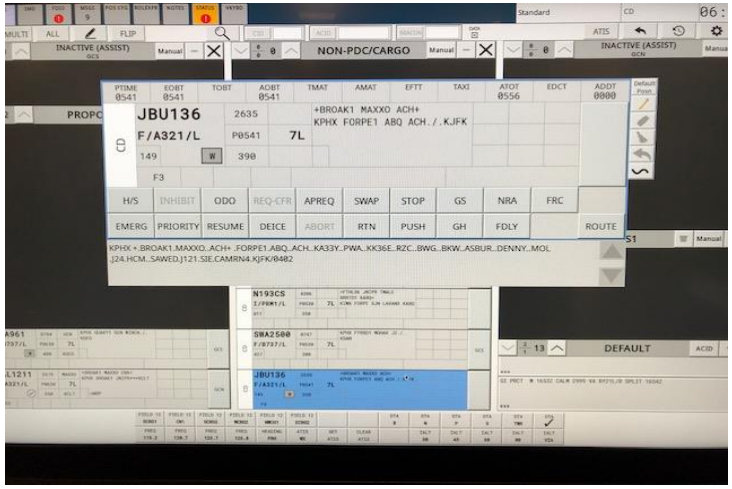
Systems Consolidation

TFDM will replace multiple unsupportable systems in the National Airspace System through integration of their functionality into TFDM. This achieves technology modernization, improved data sharing and lower maintenance costs. The systems to be consolidated include ARMT, DSP, EFSTS, AEFS, and SMA.

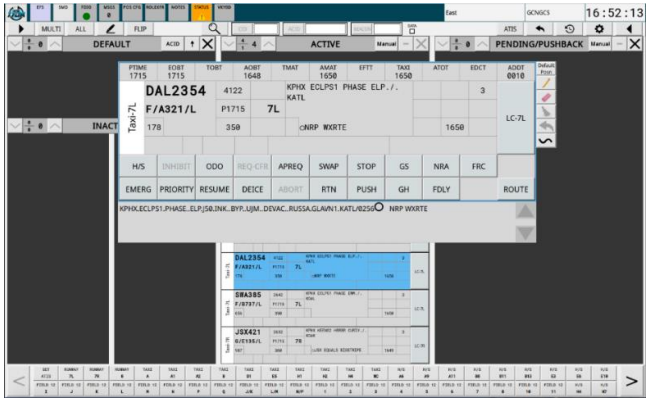
Terminal Flight Data Manager (TFDM): Build 1 Program Status

Key Site: Cleveland, OH (CLE)

- **Accomplishments**
  - New TFDM draft waterfall reviewed with Surface NIWG on March 1st
  - Completed field implementation work at CLE, PHX, CLT
  - LAS Site Survey Completed
  - Completed Build 1.4 Risk Reduction Testing
- **Planned Activities**
  - Formal 1.4 operational testing at the WJHTC starting on March 29th
  - Formal 1.4 operational testing at CLE - Summer 2022 (NAC milestone)
  - CLE Build 1.4 IOC – Fall 2022 (NAC milestone)



EFS during Testing @ PHX



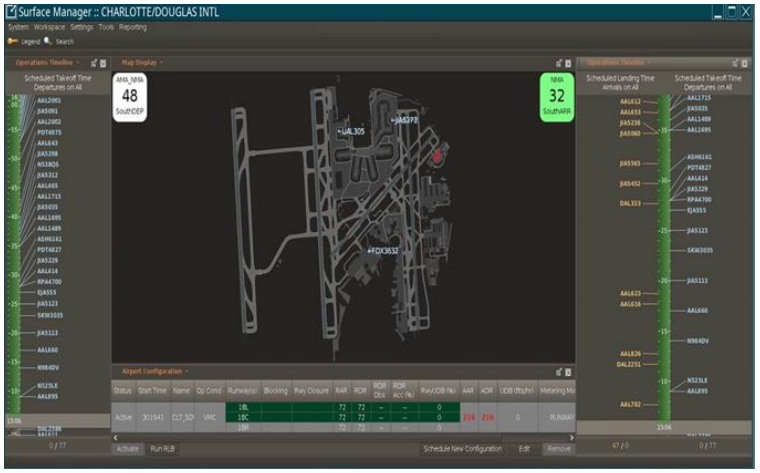
TFDM Build 1 Electronic Flight Strips Display

Terminal Flight Data Manager (TFDM): Build 2 Program Status

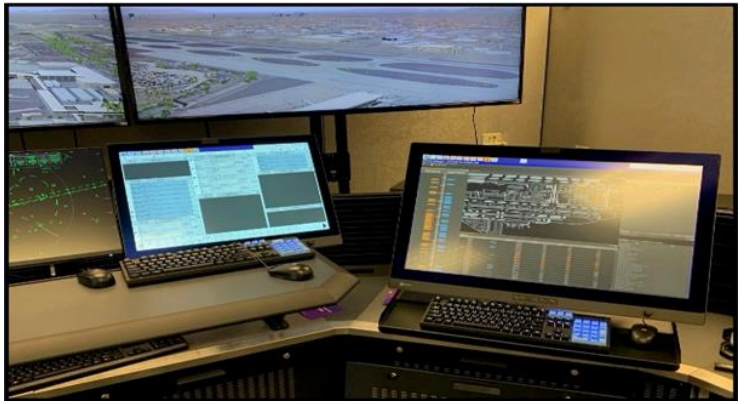
Key Site: Charlotte, NC (CLT)

- **Accomplishments**
  - Build 2.1 software development and integration completed March 11th
  - Continued vendor and flight operator testing

- **Planned Activities**
  - Formal Build 2.1 software testing begins July 2022
  - Formal Build 2.2 software delivered to the FAA January 2023
  - Continue onramping and test activities with vendors for the TFDM testbed



TFDM Build 2 Surface Management Display



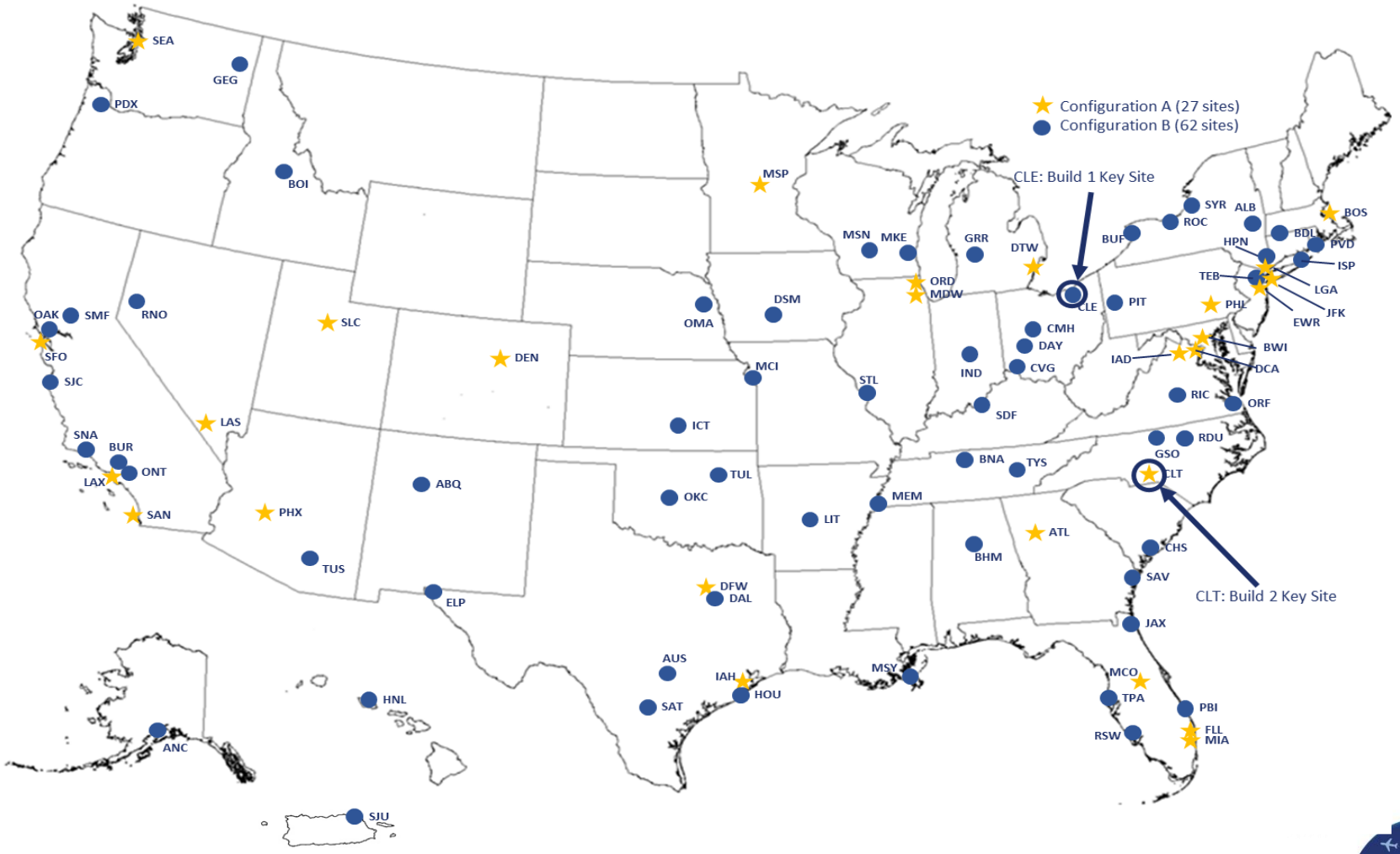
TFDM Test Systems with EFS and SM Displays

NAC Milestone Impact

SURFACE AND DATA SHARING		
PRE-IMPLEMENTATION COMMITMENTS	**Old Date**	**New Date**
TFDM program will complete the operational testing for Build 1	Q2 CY2020	**Projected Q3 CY2022***
NASA ATD-2 interim technology transfer from Phase 2: Fused IADS at CLT	Q4 CY2019	Complete
NASA ATD-2 final technology transfer from Phase 3: Terminal departure IADS at DFW/DAL	Q3 CY2020	Complete
Industry Alignment with TFDM Waterfall	Q1 CY2022 Q4 CY2022	On Track On Track
IMPLEMENTATION COMMITMENTS	**Old Date**	**New Date**
TFDM program will achieve key site IOC for Build 1 at **CLE**	Q2 CY2020	**Projected Q4 CY2022***
TFDM program will achieve the in-service decision (ISD) for Build 1 to allow additional TFDM system deployments into the NAS	Q4 CY2020	**Projected Q2 CY2023***
TFDM program will achieve IOC at 3 additional sites	Q1 CY2021	**Projected Q2 CY2023***
TFDM program will achieve the key site IOC for Build 2 at CLT	Q4 CY2021	**Projected Q4 CY2023***
TFDM program will achieve ISD for Build 2 to allow additional deployments of the full TFDM capabilities into the NAS	Q1 CY2022	**Projected Q2 CY2024***
TFDM program will achieve IOC at 5 additional sites	Q1 CY2022	**Projected Q2 CY2024***

* Not formal NJIP dates - new dates dependent on ability to travel, access FAA facilities, conduct training, conduct testing and other FAA program dependencies. If dependencies are not met, the program will not meet these dates.

TFDM Deployment Map



TFDM Draft Waterfall Schedule (CY2022-2024)

- On March 1st, TFDM Program briefed draft TFDM waterfall to Surface NIWG
- Industry will provide informal feedback to FAA
- FAA will work with industry to firm waterfall by Fall 2022

ATCT - Configuration - Functionality Deployed	ATCT	Draft Post-COVID IOC
ATCT 5 (Cleveland, OH) Key Site - Config B - Build 1	CLE	October-22
2023		
ATCT 4 (Indianapolis, IN) - Config B	IND	April-23
ATCT 1 (Phoenix, AZ) - Config A	PHX	May-23
ATCT 26 (Las Vegas, NV) - Config A	LAS	June-23
ATCT 3 (Raleigh, NC) - Config B	RDU	July-23
ATCT 20 (Columbus, OH) - Config B	CMH	August-23
ATCT 19 (San Jose, CA) - Config B	SJC	September-23
ATCT 8 (Charlotte, NC) - Build 2 Key Site - Config A - Build 2 SW	CLT	October-23
ATCT 30 (Tampa, FL) - Config B	TPA	October-23

ATCT - Configuration - Functionality Deployed	ATCT	Draft Post-COVID IOC
2024		
ATCT 6 (Los Angeles, CA) - Config A	LAX	February-24
ATCT 28 (Oakland, CA) - Config B	OAK	March-24
ATCT 16 (Houston, TX) - Config A	IAH	April-24
ATCT 15 (San Francisco, CA) - Config A	SFO	May-24
ATCT 21 (Houston, TX) - Config B	HOU	June-24
ATCT 40 (Cincinnati, OH) - Config B	CVG	July-24
ATCT 48 (Nashville, TN) - Config B	BNA	August-24
ATCT 1 (Phoenix, AZ) - Config A, Adapt Build 2 func.	*PHX*	*September-24*
ATCT 29 (Seattle, WA) - Config A	SEA	October-24
ATCT 26 (Las Vegas, NV) - Config A - Adapt Build 2 func.	*LAS*	*October-24*
ATCT 17 (Atlanta, GA) - Config A	ATL	November-24

Sites with Green Box ▭ are Build 1 or Build 2 key sites

Sites with Blue Box ▭ are Configuration A sites receiving full TFDM functionality

TFDM Waterfall is still DRAFT

Data Comm

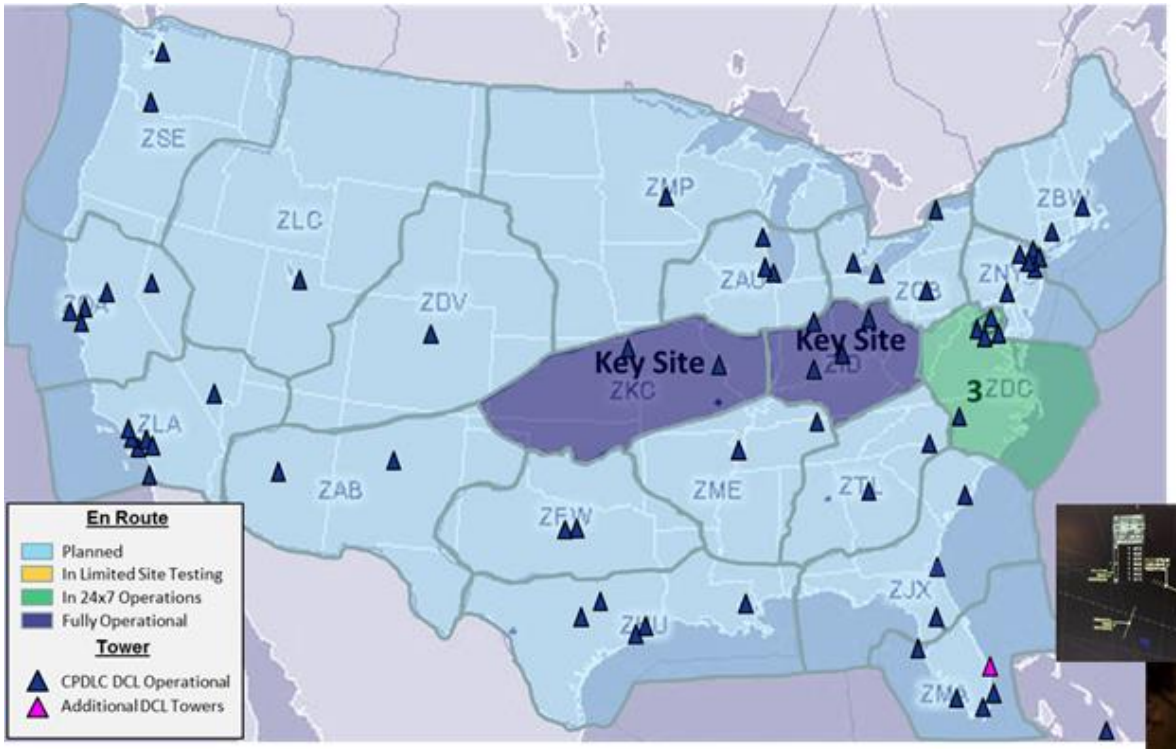
Jesse Wijntjes (FAA)

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

Data Comm Accomplishments

- Data Comm services are operational at 64 airports and the first 3 En Route Centers
- Business/General aviation & DOD communities resuming En Route participation to support operational trials
- Localized air-to-ground interop issues are being fault isolated and analyzed for needed corrective actions in the avionics

Data Comm Operational Status



Data Comm operational at 64 Towers

PBI planned for Summer 2022

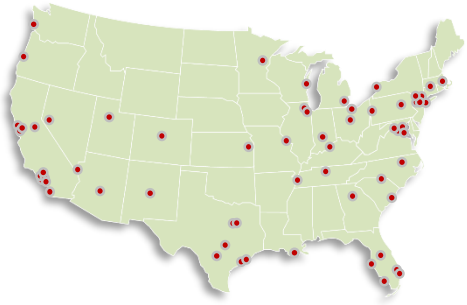
Data Comm operational at 3 En Route Centers

COVID has impacted the initial and full services deployment schedules. Facility access restrictions have been lifted and the initial services deployment has been restarted.

Data Comm Benefits

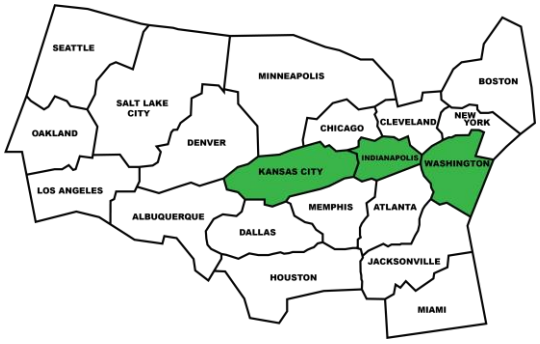
Since 2016, CPDLC DCL…

- Served 19 US Air Carriers and 70 Non-US commercial and cargo operators
- Cleared 12.05M+ flights
- Saved 2.24M+ minutes of air space user time
- Saved 3.09M+ minutes of radio time
- Prevented 28.81M Kgs of CO_2 Emissions
- Prevented 150,800+ readback errors



Since 2019, En Route Data Comm…

- Served 18 operators
- Cleared 1,746,552 flights
- Saved 779,529+ minutes of radio time
- Prevented 206,529 readback errors



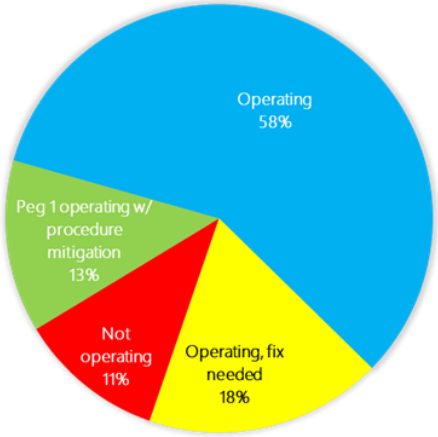
2022 Data Comm NIWG/Avionics Ad Hoc Focus Items

1. Resume en route center Data Comm deployment
2. Complete installation of Data Comm avionics updates for retrofit and newly delivered aircraft
3. Establish plans for updated avionics to be installed on all new delivery Data Comm capable aircraft
4. Continue to track progress against NextGen Joint Implementation Plan (NJIP) milestones

Data Comm Avionics Updates Fleet Status

Aircraft operating in Data Comm en route – no pending actions

Operator & Fleet Actions Complete	Status
Alaska Airlines: A321	Operating en route, no action required
American Airlines: A321, B777, B787	Operating en route, no action required
FedEx: B777, MD11	Operating en route, no action required
Southwest Airlines: B737	Operating en route, no action required
United: B777, B787	Operating en route, no action required
UPS: B744, MD11	Operating en route, no action required



Avionics Action	Operator/Fleet	Status
Aircraft operating in Data Comm En Route with Crew Procedure Mitigation		
Boeing 757/767 Pegasus 1	FedEx, UPS	Aircraft operating under procedure mitigation Avionics Fix: Q3 2022
Aircraft operating in Data Comm En Route with Open Avionics Actions		
Collins CMU 900 Core 16	**Alaska**, American, Delta, United	**ASA starting installs in April**, remaining operators delayed (COVID), aircraft operating
Airbus A320 ATSU CSB 7.5	Delta, JetBlue	Fix released Dec 2020, aircraft operating, installs 61% complete; investigating technical issue
Boeing 747-8 ATN-203	UPS	Planned – Q4 2022, aircraft operating
Aircraft not operating in en route due to Open Avionics Actions		
Collins VDR Update	Alaska, United	Install delayed (COVID), aircraft removed
Boeing 757/767 Pegasus 1	United	Pending Peg 1 Avionics Fix: Q3 2022
Airbus A220	Delta, JetBlue	Pending avionics fix, planned Q4 2023
Airbus A350	Delta	Pending avionics fix, planned Q4 2022

Operating, no action required	Operating fix needed	Peg 1 operating with mitigation	Not operating

Data Comm NAC Open Action:
Boeing & Airbus to provide milestones for needed fixes

1. **Awaiting Airbus milestone for A220 avionics fix**
   - ✓ Airbus working on plan to address all open items – IMA Build 8.0A3 expected Q4 2023
   - > A Radio Interface Unit (RIU) update is currently being discussed to accompany the CPDLC changes in Avionics BL8.0A3 SW. Timeframe not confirmed yet.

2. **Airbus milestone for A350 avionics fix: End of 2022**
   - ✓ Airbus launching new ACR standard to be available for new and retrofit aircraft by end of 2022

3. **Airbus milestone for A320 retrofit for ATSU older H/W: Q2 2022**
   - ✓ ATSU CSB 7.5.1 is planned, SB available Q2 2022
   - ✓ RDAF (Repair and Design Approval) to be released prior to the SBs availability to speed up retrofit

4. **Boeing milestone for CMU900 Core 16 production cut-in for B737MAX: End of 2022**
   - ✓ Boeing plans to add Core 16 to TC for NLT end 2022 production introduction
   - ✓ B737MAX customers may begin configuring aircraft deliveries with CMU900 Core 16
     - Actual new delivery availability based on customer configuration and delivery timeline

5. **Awaiting Boeing milestones for Nav Database revisions to mitigate en route STAR in free text for Pegasus II, B787, and B747 NG FMC**
   - > B787 and B747 NG FMC will require an FMC update in addition to NDB changes
   - > Boeing does not have firm milestones for completion

Review of Action Items & Other Business

Kimberly Noonan, NAC Committee Manager (FAA)

Upcoming Meetings

- **NAC SC**
  - April 6, 2022 (2:00pm - 5:00pm ET)
  - May 4, 2022 (2:00pm - 5:00pm ET)

- **NAC**
  - Summer 2022 (TBD)
  - Fall 2022 (TBD)

Closing Comments & Adjourn

Chip Childs, NAC Chairman

President & CEO, SkyWest, Inc.

NEC
Read-Ahead & Back-Up Slides

Task 18-4 Northeast Corridor: Implementation Risks & Mitigations of the NextGen Priorities Joint Implementation Plan

"The FAA requests that the NAC identify Northeast Corridor risks and mitigations to the successful operational implementation of industry commitments with respect to the NextGen Priorities Joint Implementation Plan through calendar year 2021. This should also include any needed industry mitigations to support successful operational integration of the joint commitments."

Summary of Activities (since Oct 2021 NAC)

- Updates on status and progress of remaining implementation milestones:
  - Revised schedule for NEC TBFM (PHL and EWR)
  - Completion of Industry multi-route TOS milestone
- Updates on "NextGen Opportunities" items
  - LGA 31 public approach procedure
  - High-performance routes for TEB/HPN
- Updates on EWR airspace move
- Updates on VOR MON workgroup Fall 2021 meetings
- Status of MARS and dependent EoR safety studies
- Status of other TBO implementations

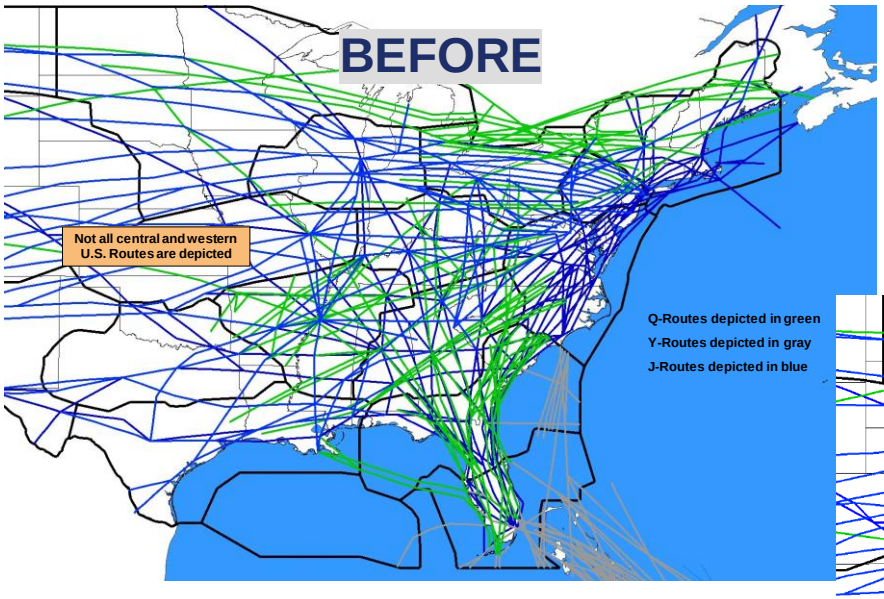
NJIP Commitment Summary

- Q4 2021 Completions
  - DSP Enhancements (FAA Implementation)
  - PDRR/ABRR Enhancements (FAA Implementation)
  - Evaluate multi-route TOS (Industry)

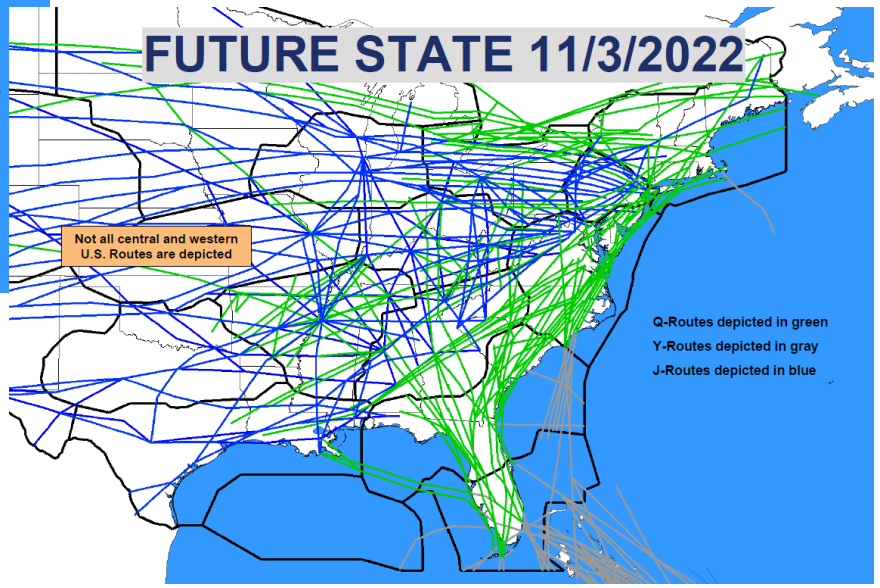
- Q1 2022 Completions
  - Improved departure management for flights destined for LGA (FAA Implementation)

- Remaining implementation commitments still at potential delay risk
  - Eastern seaboard high-altitude routes (Atlantic Coast Routes)
  - Arrival time-based metering (TBFM) for PHL and EWR

Atlantic Coast Routes



ACR is one of the biggest routes changes in the NAS



- **What:** 39 new/amended Q Routes and Y Routes will replace the north-south high-altitude route structure along the east coast of the United States
- **Why:** Transition to a PBN-Centric NAS thus decreasing reliance on ground-based NAVAIDs
- **When**: Changes being implemented on separate chart dates 10/10/2019 through 11/3/2022

Atlantic Coast Routes

Completed Implementation Milestones

- ✓ 10/10/2019 Published/Implemented 1 New Y-Route and 8 Waypoints
- ✓ 11/7/2019 Implemented ZDC Low Altitude Sector Changes
- ✓ 1/30/2020 Deleted/Amended 33 J-Routes/Q-Route (FL Metroplex)
- ✓ 1/30/2020 Deleted 5 CHS STARs
- ✓ 3/26/2020 Deleted/Amended 6 SIDs (BWI/IAD/DCA/HEF/ADW)
- ✓ 5/21/2020 Amended 2 Q-Routes: Q75, Q475
- ✓ 5/21/2020 Amended 1 SID (DOV)
- ✓ 7/16/2020 Deleted/Amended 18 J-Routes
- ✓ 9/10/2020 Published/Amended 8 Q-Routes
- ✓ 11/5/2020 Published/Deleted/Amended 9 STARs (PHL/EWR/TEB/LGA/DOV/WRI)
- ✓ 11/5/2020 Published/Deleted/Amended 9 SIDs/STARs/SIAPs (CHS/JZI)
- ✓ 11/5/2020 Deleted/Amended 10 J-Routes, 1 Q-Route
- ✓ 2/25/2021 Published/Deleted/Amended 20 RDU SIDs/STARs/SIAPs
- ✓ 10/7/2021 Published/Deleted/Amended 28 Q-Routes/Y-Routes/AR-Routes
- ✓ 10/7/2021 Amended 1 SID (ATL), 1 STAR (WRI)
- ✓ 12/2/2021 Deleted/Amended 6 Jet Routes

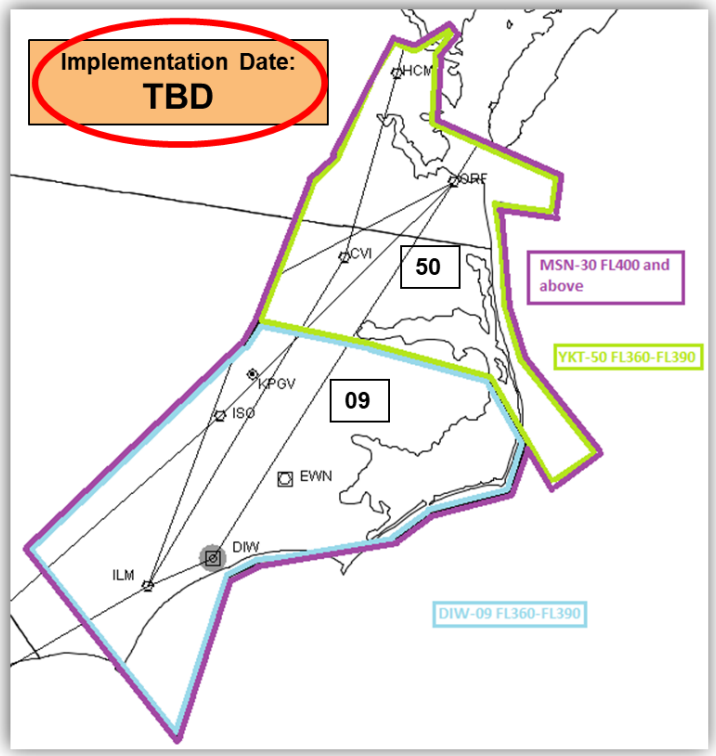
COVID-19

72 Routes Published, Amended, Deleted in 2020-2021

Atlantic Coast Routes Sector Changes

ZDC High Altitude Sector Changes

- **Stratify Sectors 09 & 50 to create <u>new</u> Sector 30**
- **Resulting 3 Sectors**
  - 09 DIW Ultra High
    - FL360-390
  - 50 YKT Ultra High
    - FL360-390
  - 30 MSN Super High
    - <u>FL400-ABV</u>
- **To help reduce sector workload/complexity and improve sector throughput**



NEC Inputs to "Opportunities" Discussion

★ LGA RNAV GPS approach to Rwy31: public instrument approach procedure that can provide a stable and guided path to the threshold of Rwy31, enhancing the safety

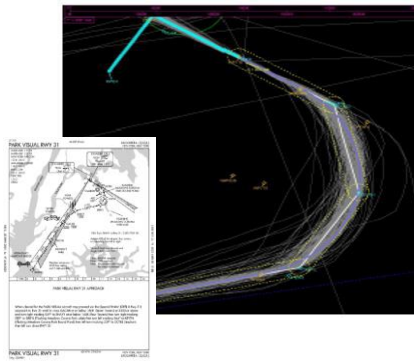
★ TEB/HPN escape routes: provides for an alternate route out of the airspace for capable business aviation aircraft

- LGA GLDMN and JFK 31L SKORR departures: use altitude separation to allow simultaneous departures; dispersal headings from LGA 13 provide departure efficiency; also improves efficiency by providing JFK with opportunities to utilize 31L for departures
- EWR 22L/29 operation: address the loss of a second landing runway at EWR during southwest to west winds, enabling a significant reduction in minutes of arrival delay
- LGA ILS 13 approach deconflicting TEB/EWR/LGA: deconflicts the three airports, to improve overall airspace operations and reduce the number of configuration changes

★ Recommended by NAC on Aug 6 and FAA has agreed to pursue

Northeast Corridor Accomplishments –
Moving forward on Opportunities Recommendations

LGA Rwy 31 Approach



Operational stakeholder discussions

Operator simulations

Environmental review
Flight check

PARK Visual implementation

Anticipated public GPS approach publication

Data gathering

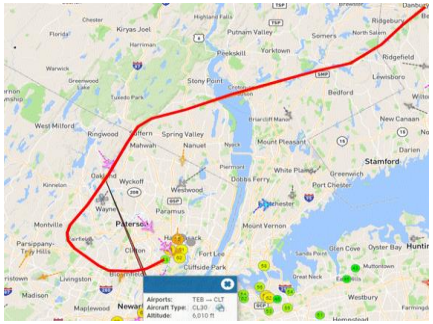
Q4 2019	Q1 2020	Q2 2020 ★	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022

TEB/HPN High Perf Routes

Climb performance issues discussed

Climb performance trial conducted

High Performance Routes planned inclusion in TEB/HPN escape route publication



★NextGen Opportunities discussed at Aug 2020 NAC

Status of "Opportunities" Recommendations

- LGA Runway 31 approach procedure - PARK Visual
  - Collaborative Operator, Airport and FAA discussions
  - Operator flight sims completed by late 2020
  - FAA environmental review and flight check completed early 2021
  - Data collection ongoing, feedback positive
  - Public procedure on track for March 2022

- High-performance escape routes for TEB/HPN
  - Reviewed NBAA tabletop exercises from Fall 2019; feedback on viability of proposed climb gradients
  - Additional test concerning climb parameters completed
  - Procedures to be added to the escape route publication by end of 2021