NextGen Advisory Committee
June 12, 2023 Meeting Summary

The NextGen Advisory Committee (NAC) convened in a hybrid format on June 12, 2023 with in-person attendees convening at Federal Aviation Administration (FAA) Headquarters in Washington, DC. The meeting discussions are summarized below. Reference the attachments for additional contextual information.

List of attachments:

- Attachment 1: NAC Presentation Deck
- Attachment 2: Attendance List
- Attachment 3: Public Statements

Opening of Meeting

NAC Chair, Mr. Chip Childs (SkyWest, Inc.), opened the meeting and welcomed in-person and virtual attendees. He turned the floor over to the new acting FAA Administrator, Ms. Polly Trottenberg for opening remarks.

Ms. Trottenberg said she's had a lot of experience tackling FAA issues in her previous role as the Deputy Secretary of Transportation. She went on to provide insight regarding a meeting that the Secretary of Transportation, Pete Buttigieg had with the airlines Chief Executive Officers, noting the summer flying season. Ms. Trottenberg added that she'll remain in an interim role as the FAA Administrator until the White House finalizes a successful nominee.

Ms. Trottenberg handed off to acting Deputy Administrator, Ms. Katie Thomson (FAA). Ms. Thomson thanked the NAC for all the great work and continued progress. She said there is an end in sight as we evolve and see how we can deliver the full benefits of NextGen. She noted the NAC's importance in playing a critical role to help advance NextGen and achieve the full benefits. Ms. Trottenberg added that the Deputy Assistant Secretary for the Department of Transportation (DOT), Mr. Keith Washington will be the acting FAA Chief of Staff.

Mr. Childs thanked both Ms. Trottenberg and Ms. Thomson and handed off to the Ms. Kimberly Noonan, NAC Committee Manager (FAA) for administrative announcements and housekeeping items.

Public Statements

After the public meeting announcement, Ms. Kimberly Noonan (FAA) invited the following public speakers to make their respective pre-approved public statements

Reference Attachment 3 for the full text of the following public statements:

- Ms. Cindy Christiansen of Aviation-Impacted Communities Alliance
- Ms. Darlene Yaplee of Aviation-Impacted Communities Alliance

Chair's Report

Mr. Childs then provided the Chair's Report. To begin, he called for a motion to approve the February 28, 2023 NAC Meeting Summary Package, which the NAC approved.

Mr. Childs then called for motions to approve the February 28, 2023 NAC Meeting Summary Packages.

Outcome: The NAC passed a motion to approve the February 28, 2023 NAC Meeting Summary Package.

Mr. Childs welcomed Vice President of Flight Operations at FedEx Express, Mr. Patrick Demento and the Vice President of Network Operations at United Airlines, Mr. Joe Hines and thanked them for joining the NAC for the first time.

Mr. Childs announced that several NAC members plan are focused on the FAA Reauthorization and the Hill. Next, he said how industry will continue to navigate through immense challenges, including a strong return to demand and uniform pilot shortages. He said the work being done at the NAC is key to advancing NextGen and aviation to the future NAS.

Mr. Childs concluded the Chair's report and handed off to the NAC's delegated Designated Federal Officer, Ms. Thomson for the FAA Report.

FAA Report

Ms. Thomson handed off to the Chief Operating Officer for Air Traffic Organization, Mr. Tim Arel (FAA) and the Deputy Associate Administrator for Aviation Safety, Ms. Jodi Baker (FAA), for their opening remarks.

Mr. Arel recognized Mr. Warren Christie (JetBlue Airways) and Ms. Lee Brown (JetBlue Airways) for their support, joining him to deliver a joint FAA-Industry briefing on 2018 Reauthorization Act, Section 547: Enhanced Air Traffic Services at the hill and expressed FAA's appreciation for their work. He added that it was nice to share our work, collectively, and our focus moving forward. He noted that our priorities remain the same. He agreed with the chair that we certainly have reauthorization and plenty of budget discussions coming up, so there is a caveat that some of the things he will discuss may not transpire as legislation is passed.

Mr. Arel indicated the FAA commitment to completing the distribution and implementation of Terminal Flight Data Manager (TFDM) and Data Communications (Data Comm). Mr. Arel proceeded to provide the following status update for Data Comm and TFDM, respectively:

Data Comm:

- Tower Data Comm is enabled at 65 Air Traffic Control Towers
- En Route Data Comm is currently enabled at 11 centers
- FAA will provide En Route Controller-Pilot Data Link Communication (CPDLC) at 75% by Spring 2024
- En Route is expected to be available at all locations by early 2025

TFDM:

- In addition to electronic flight strips capabilities, TFDM is also an important tool for surface metering, creating benefits to reduce greenhouse emissions

- TFDM is presently accounted for in the President's budget submission
- Deployment scheduled at 49 airports

Next, Mr. Arel commented on the safety risk actions that emerged during the spring 2023 Safety Summit held at MITRE in McLean, VA due to the lack of surface surveillance. As a result, the FAA has taken action to improve situational awareness at facilities that do not have surface surveillance. Mr. Arel identified that the FAA has 35 airports that use either Airport Surface Detection Equipment – Model X (ASDE-X) or surface radar, and 9 that use Airport Surface Surveillance Capability (ASSC). In addition, he reported that over 450 towers do not have surface surveillance or situational awareness tools. He said the FAA is looking into cost-effective air traffic awareness tools to enhance the surface safety environment. The FAA plans to follow-up on this issue at the next Industry Day and will issue a request for information (RFI). Mr. Arel added that there will be a prioritization exercise with all the competing programs, however, this safety risk needs to be addressed.

Next, Mr. Arel reported that operations are running very well; hiring and training technical workforce being FAA's priority and is at about 80% of their target goal for this year. As we go into 2024, the FAA's intent is to hire 1,800 controllers, which is the max that the FAA can accommodate not just in the HR process, training in the academy, but also accounting for the training backlog (coming out of COVID) and the FAA wants to make sure we have as many controllers as possible.

Mr. Arel provided an update on the controllers and reported an uptick on the certified professional controllers in the last two years. However, there is a greater gain that is being achieved in the overall system that may not be readily apparent. Over the course of the controller's careers, many of them become supervisors, traffic management coordinators, and support staff – including safety and quality assurance roles. He noted that these positions are important in making sure that we run the National Airspace System (NAS) efficiently and safely. He added that things are moving in the right direction.

Mr. Arel then acknowledged the Memorial Day weekend. It was a combination of industry and the FAA that resulted in less than a 1% cancellation (0.6% of all flights were cancelled and 1.5% delayed). He said Thursday, May 25th was the busiest day post-COVID and our forecast shows that Juneteenth weekend will be much busier. With that said, we are in a pretty good position for the summer traffic.

Lastly, Mr. Arel provided insight to the June 26-27th FAA Space Industry Day. There have been an increasing number of space operations, the FAA has stood up a collaborative decision making process with space industry and traditional aviation. Mr. Arel along with Mr. Kelvin Coleman (Associate Administrator for Commercial Space Transportation) will host the Space Industry Day down at Cape Canaveral.

Mr. Arel concluded the Air Traffic Organization update and handed off to Ms. Baker for an update on 5G.

Ms. Baker acknowledged the challenges this in the past 18 months, however, everyone's attention to the 5G issue has paid off leading to an increase in retrofits to aircraft. Ms. Baker recognized the continued work with international carriers and that they are encouraged by the progress in Europe with our allies in Asia. She expressed appreciation of the continued global commitment to aviation safety.

Next, she noted that the final Airworthiness Directive for Transport and commuter airplanes was published in the Federal Register on Friday, May 26, 2023. This directive supersedes the one that was originally issued in 2021. The directive requires aircrafts in the United States to be equipped to operate

safely in the vicinity of 5G C-Band wireless signals by February 1, 2024. The directive also mandates that transport category airplanes used in scheduled passenger and cargo flight operations must have 5G C-Band tolerant radio altimeters or an acceptable radio frequency filter. She said FAA will continue working collaboratively and hold multiple meetings a month with stakeholders around 5G.

Ms. Baker concluded her update on 5G and handed off to Ms. Thomson to conclude the FAA report.

Ms. Thompson thanked the Industry for complying with the 5G requirements and it is remarkable what industry has accomplished to equip and prepare for 5G. Lastly, she stressed that we need the same mentality used for 5G to come together to fully tap into NextGen benefits and opportunities.

Ms. Thompson concluded the FAA report and handed it back to the Chair.

Mr. Childs emphasized the importance of the NAC's work and impact relies on FAA's funding for programs and future technologies. He noted that the messaging needs to be consistent funding for these viable programs and projects. He continued, that he has seen what happens when there isn't consistent funding and things get tied up in budget and debt limits. He concluded his remarks saying that there's not a tremendous amount of appropriation for the FAA, but it is enough to where some things can happen inadvertently compared to what this committee knows is the long term objective, which is consistent funding. Mr. Childs noted that FAA needs is consistent predictable funding for these projects to continue to have impact.

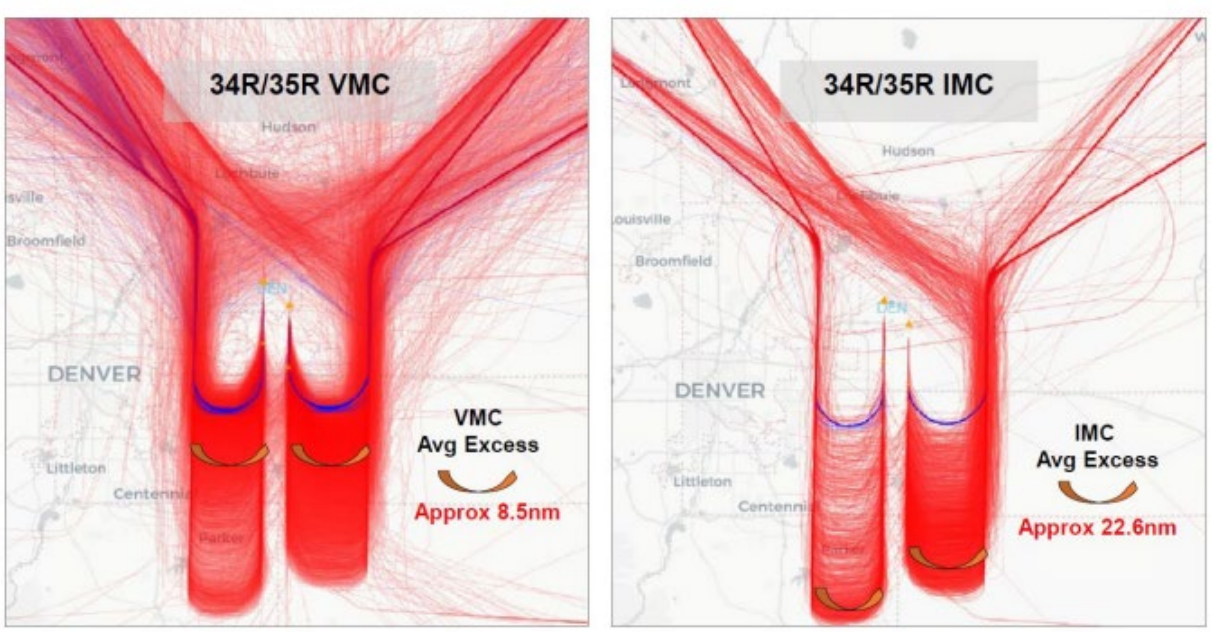
Chair's Roundtable: NextGen in Denver

Mr. Childs began the Chair's Roundtable "NextGen in Denver". Denver International airport has a strong history of NextGen implementations and he thought it would be beneficial to discuss the efforts and returns on investments from some of the committee members. SkyWest Airlines has roughly 1,400 arrivals in Denver each month and a solid presence in RNP AR approaches accounting for about 8.5% of all RNP AR approaches at Denver. Based on SkyWest performance between January and April, SkyWest could save 456 metric tons of carbon emissions using these approaches by the end of the year. Mr. Childs asked Mr. Ron Renk with United Airlines and Mr. Trey Turner with Southwest Airlines to provide some of their insights to NextGen at Denver. The purpose of this discussion was to encourage productive dialogue from the committee members. Mr. Childs first hands off to Mr. Renk.

Mr. Renk began his presentation providing an overview on what the big deal is in Denver for NextGen. There are four fundamental cases where we see benefits for Spaced Based approaches:

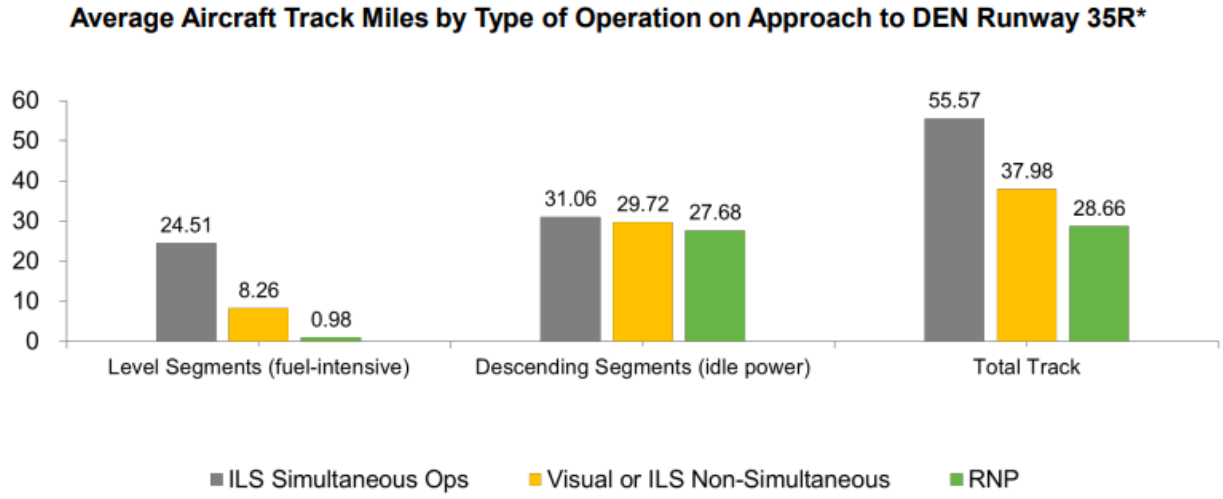
1. Efficiency and Carbon Reduction
2. Terrain constrained airports
3. Airspace constrained airports
4. Self-contained approach, redundancy for busy hub operations

He continued that we've heard a lot about the benefits of Established on RNP (EoR) and we're excited about getting to 100% being able to do RNP AR or EoR all the time at Denver. Mr. Renk then shared the following graphic which shows the arrivals at Denver 34R/35R on VMC approaches and IMC approaches.



The blue arcs on each side show the RNP approaches. Looking at the VMC graphic on the left side you will see that the average excess from not doing RNP is 8.5 nautical miles (NM). Looking at the IMC graphic on the right side you will see there is an approximate excess of 22.6NM.

Mr. Renk walked through the following graphic which shows the average aircraft track miles by type of operations on approach to Denver's runway 35R.



On the following slide Mr. Renk highlighted the standard deviation column. The graphic shows that the standard deviation of miles flow for ILS is 5.24 and for RNP is .11. He noted that EoR can possibly improve schedule reliability. Airlines block times today are based on what we normally do, which could be VMC. Approximately 5% of our days are IMC days. When airlines tell their passengers that they are going to deliver them at 10:00, you have to deliver at 10:00 whether it is an IMC or VMC day. With EoR, airlines can eliminate a lot of variability in their flight schedules.

RWY35R Downwinds OCT 2021								
RWY35R Approach Direction	RWY35R Approach Assigned	WX Below 5000 CIG 5NM VIS	WX Above 5000 CIG 5NM VIS	RWY35R Total Flights	All Flight		Level Flight	
					Avg Miles Flown	Std Dev of Miles Flown	Avg Miles Flown	Std Dev of Miles Flown
Downwind	**RNP**	**7**	**540**	**547**	**13.24**	**0.11**	**1.46**	**1.97**
	Visual	76	1156	1232	20.14	4.98	8.01	5.57
	ILS 5-9-7 SIMOS	58	65	123	38.43	5.24	25.90	7.62

Carrier	Proportion RNP Equipped	# Downwind Flights with RNP Equipage	# Downwind Flights that Flew RNP Turn	RNP Success Rate for Downwind Flights			
				Overall	High	Medium	Low
100% Equipped	100%	31,066	14,625	47.1%	16.9%	47.6%	72.3%
Non-100% Equipped	54.8%	27,904	7,580	27.2%	10.4%	31.0%	47.5%

Next, Mr. Renk shared two videos. The first video shows aircraft that is not RP capable, completing an ILS on an IMC day and another aircraft using RNP to fill in the gap that is left on the arrival approach. The second video shows a visual representation of what having mixed equipment means. The video shows a conga line of aircraft completing RNP AR approaches; however, a United Airlines plane, which was not equipped for RNP, breaks the line because they are not able to accept the clearance for RNP and therefore other airplanes, even though they are equipped, cannot accept the clearance. Mr. Renk stated that industry should pay attention because equipping means benefits, but that controller tools are also needed.

Next, Mr. Renk explained the following lessons learned for United Airlines:

- More Pilot training and use needed to get proficient
    - Pilots property close discontinuities
    - Stay on downwind on worst case scenario
    - Use of route 2 or secondary flight plan
- Better Controller understanding of pilot/aircraft limitation on RNP approaches
    - No last minute request for RNP
    - Vectors instead of re-joining STAR when pulled off STAR

Mr. Renk then said that the airlines have seen an improvement in the RNP numbers at Denver and the numbers have been trending up for the last couple of years.

Mr. Renk shared the following items that show what is next with RNP AP:

- Temperature compensation in FMC/FMGC to improved consistent vertical path
- Need more controller tools and automation
    - Terminal Sequencing and Spacing (TSAS)
    - Trajectory Based Operations (TBO)
- New EoR rules for less than widely spaced
- Multiple Airport Route System (MARS)

He then shared the following, outlining the TBFM capabilities they are monitoring and working with at the Denver Center (ZDV). He noted that Denver has pulled almost every different capability out of TBFM possible.

- Single Center Metering (SCM) at Denver Center – manages metering internal to ZDV
- Adjacent Center Metering (ACM) – extension of SCM to ZLA
- Constraint Satisfaction Point (CSP) – a meter arc or fix or other meter reference element
- Coupled Scheduling (CS) / Extended Metering (XM) – add additional CSPs for an aircraft to meet the scheduling time of arrival along their routes. This results in more optimal distribution of delays over a greater distance from the airport of CSP
- En Route Departure Capability (EDC) – scheduling capability that assists in formulating release times to miles in trail restriction
- Departure Scheduling – obtains a release from TBFM to schedule into an arrival flow
- Integrated Departure/Arrival Capability (IDAC) – capability allows the ATCTs to conduct departure scheduling electronically (on the waterfall)

Mr. Renk concluded his briefing saying that NextGen is a team effort.

Mr. Childs then lead the following discussion on equipage with the NAC members, FAA executives, NAC subject matter experts and presenters:

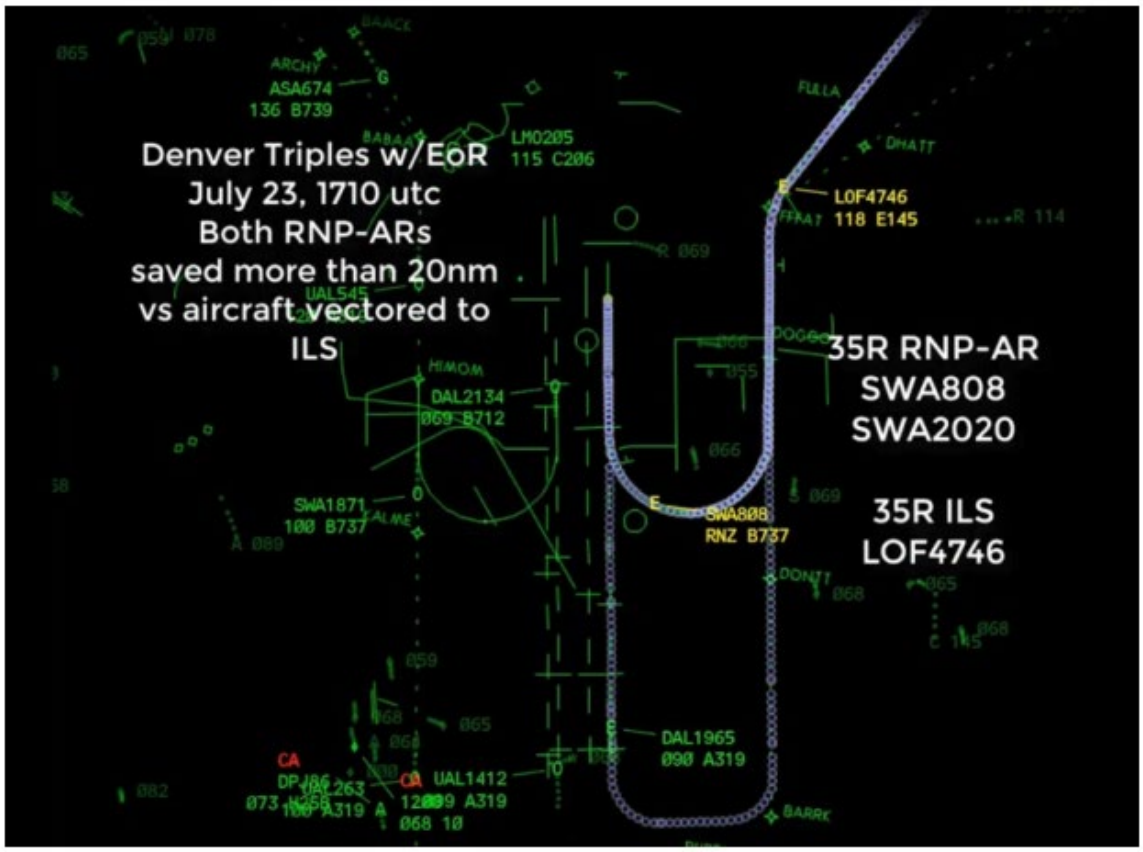
- Mr. Childs shared that SkyWest Airlines has about 175 fully equipped aircraft and about 50% of the CRJs 200, which are nearly impossible to fully equip without significant investment. He asked, when there is a break in the "conga line" how long does it take before the ATC recover. Mr. Renk answered that it requires a big hole somewhere along that line to be able to reset. Mr. Renk then went on to say, the more industry equips, the more that this type of disruption will be a problem. He explained, that unequipped aircraft will cause a bigger disruption to future "conga lines".
- Mr. Joe Heins, United Airlines NAC Representative, asked Mr. Renk if there was a goal for training pilots and controllers. Mr. Renk responded by saying that Denver uses Converging Runway Display Aid (CRDA) which shows the controllers opportunities where they can use EoR, but it doesn't create the opportunities. He continued, so the best thing is everybody equipping to that level.
- Mr. Childs asked Mr. Renk what is his guess of the equipment ratio in Denver. Mr. Renk responded that he would guess somewhere around 80% equipped. He pointed out that Airbus are United's biggest offenders. He estimated that by November 2023, United will be 100% equipped and 100% of their pilots trained.
- Mr. Paul Fontaine, Acting Assistant Administrator for NextGen (FAA), chimed in and said that the FAA deployed EoR as they looked for airports that had high concentrations of good equipment. Places like George Bush Intercontinental Airport (IAH); Denver International Airport (DEN), and Los Angeles International Airport (LAX).
- Mr. Childs asked if there was a graph or something out there that shows what percentage of equipage that will provide the maximum yield for a high level of efficiency. He said his intent is to get the Regional Airlines into the conversation. Mr. Renk replied that he has seen those numbers, however, without tools on both sides, we will never see 100%. He mentioned that MITRE will have some numbers to show a theoretical configuration with 100% equipment.

- Mr. Patrick Demento asked, in Denver and under certain configurations when you have more runways to use, what percent equipage would suggest taking the unequipped airplane out of the "conga line" so you don't break the line with people who are equipped and capable of using EoR. He asked if there were any conversations locally around making those decisions before we get to the point of the line being broken. Mr. Renk replied, that they are not doing that kind of advanced thinking. He noted that some of the controllers use some creating thinking to pull the offender out and send them to another runway so they don't break the line.
- Mr. Patrick Demento noted that this opportunity seems to be configuration dependent. He mentioned that at LaGuardia Airport you can't break someone out of the line and that the opportunity is only available in larger airports. Mr. Renk replied that is why he would like to see EoR become something other than widely spaced. He mentioned Austin's airport is a good example because while they aren't able to land on both sides at the same time, they have a higher rate of use of the RNP AR procedures. He mentioned if EoR was available at less than 9000 feet, they might be a contender and would likely produce good numbers if it was available to them.
- Mr. Warren Christie said that this highlights the need for MCL compliance, especially in the Northeast and any airports where there aren't any runway spaces. Mr. Renk followed up that it is important when we get to the MARS concept, where they are able to deconflict two airports using this technology.

Mr. Child concluded the discussion from Mr. Renk's briefing and handed off to Mr. Turner to provide Southwest Airlines' briefing on NextGen at Denver.

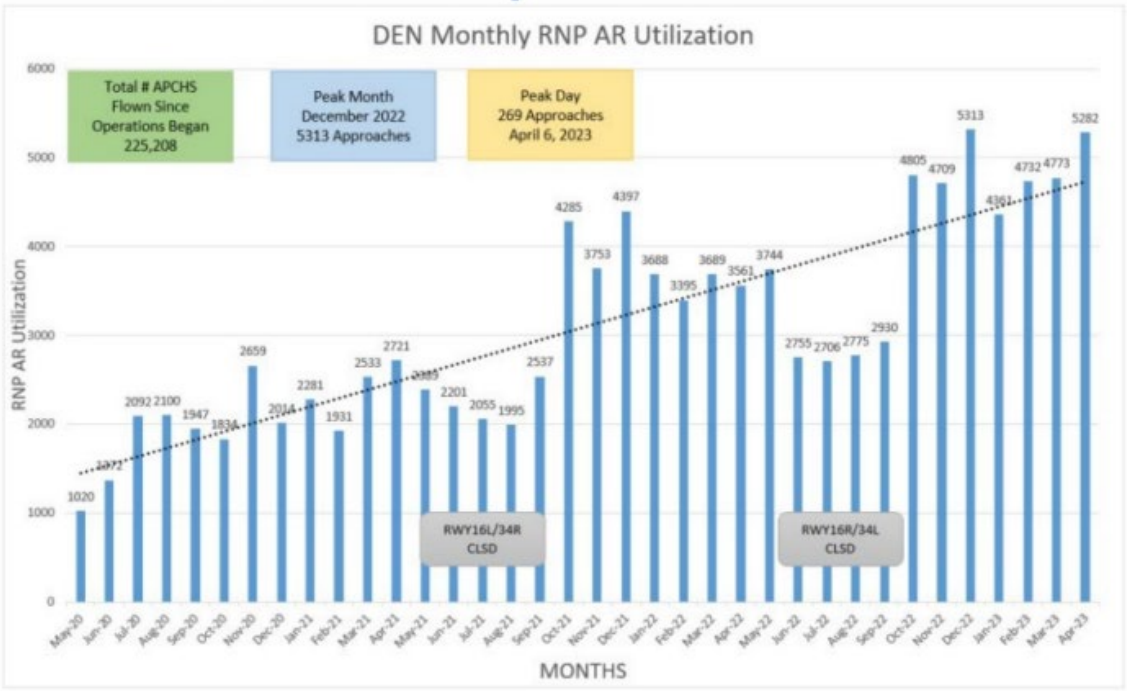
Mr. Turner began his presentation providing an overview of the briefing. He said this was a joint task with Southwest Airlines Air Traffic Management team and Flight Operations Technical team.

Mr. Turner started by identifying RNP utilization, Data Comm DCL, and Time-Based Flow Management (TBFM) as their three key areas of NextGen for Denver International Airport. He said they are seeing real benefits with EoR operations. He provided the following (below) snapshot which shows a Southwest Airline 808 aircraft on an RNP approach and a Trans State Airline aircraft that was vector at greater than 20NM to complete an ILS approach.



He continued, with RNP advancement Southwest Airlines identified that the new rules at play in Denver and the innovative minds are yielding greater efficiencies for all of the Southwest Airlines aircraft. Southwest is 100% RNP AR capable and has 100% of pilots trained. Mr. Turner then provided a breakdown of fleets and the number of successful RNP approaches in Denver for April 2023.

Mr. Turner noted that there are encouraging trends at Southwest Airlines RNP count. He provided the following (below) graphic which shows the monthly RNP AP utilization. He noted that you will see a few dips in the number of RNP approaches and they attribute that to the closure of runway 16L/34R and 16R/34L. He continued, even with those closures, the trend is still widely encouraging as far as the sustainability standpoint goes.



Mr. Turner continued saying that the key question for Southwest Airlines, Industry, and the FAA is how do we continue to drive these numbers up. Southwest Airlines noted the average time savings of 1.1 minutes per flight and a ground track distance savings on average 4.1NM and a fuel savings of 83lbs per flight. He said that they are showing a 16.2% of successful RNP approaches flown. To capture this they use geospatial position data, where it can actually determine if an RNP approach was flown versus an inspector just flying straight in segment, which could be potentially an ILS. The data does not capture what was selected in the FMC. Mr. Turner believes that it is actually a much higher rate of successful RNP approaches.

Next, Mr. Turner highlighted the Data Comm CPDLC DCL benefits for Southwest Airlines. He reviewed the following graphic which shows the year worth of data from February 2022 to February 2023 on the left and the February 2023 data on the right. He noted again that they are 100% equipped to participate in this NextGen capability.

The last area Mr. Turner highlighted is Time-Based Flow Management which is identified as a prerequisite for TBO. He noted that as far as their data is concerned, there is a more consistent use of metering at the Denver Center's airspace since its deployment in 2021. He said since the capability deployed, Southwest Airlines had an increase in RNP approaches, so it is helping drive those numbers up. He noted that it was interesting watching how the extended metering time played out.

Mr. Turner concluded that Southwest Airlines has truly been a fan of the advancements of Denver and appreciates that further deployment of these capabilities and that the "conga line" aren't broken moving forward.

Mr. Childs said that these briefings show good success for a number of reasons. He said he thinks it is something that is pretty complicated as we continue to evaluate what he says is a very difficult aircraft to equip, but has a long life ahead of it. He said we have to look at it in a different perspective to get equipage complete.

Mr. Hines noted that we are celebrating the victories here with this work. He asked if there is a team that can come up with a business case for the industry as to why we should have all airplanes equipped. He said this should include cost and how we transition these victories around the approaches and other technologies in Denver to MARS solutions for the Northeast.

Mr. Renk responded to Mr. Hines noting that the MCL activity last round was trying to put together a business case, however weren't able to complete it in time, but that was an item he wanted to achieve. He mentioned he thinks it would help especially for some of the regionals that don't have big staffs and don't have tech pilots to look into these things.

Mr. Fontaine chimed in saying as far as MARS is concerned, the FAA continues to work this activity. He noted that this is one activity that got a little delayed during COVID. He said this is a lengthy process of doing all of the safety case work, including flying it in the simulators in Oaklohoma City. Mr. Fontaine said that the work is still underway, but just a bit delayed. The FAA remains committed to MARS.

Ms. Lee Brown commented, that the Northeast Corridor (NEC) group worked from the very beginning on the MARS concept to identify the priority procedures that would see the most benefits. She noted that two of the procedures were reiterated in the PBN Clarification work that was completed under the NAC. She continued that the group is aware that there was some slowdown, but heard that there has been some good movement and that we should see some early applications relatively soon. Lee mentioned that she and Mr. Ralph Tamburro (PANYNJ), NEC NIWG Co-Chairs, will be happy to provide a briefing at the next NAC.

Mr. Childs concluded this section thanking everyone for their participation. He then closed this topic and started a 10-minute break

NAC Subcommittee Chair's Report – NIWG Status

Mr. Childs hands off to Mr. Warren Christie (JetBlue Airways), NAC Subcommittee Chair, for the NAC Subcommittee (SC) report.

Mr. Christie thanked Mr. Childs for the time to present the SC report. He identified that the SC will provide updates from the NextGen Integrated Working Groups (NIWGs), which will consist of an update on their commitments and expected risks and associated mitigations efforts for each focus area, and

lastly the SC group will provide a status update of the NAC Task 23-1: NAS Airspace Efficiencies. Before handing off to the NIWG's, Mr. Christie highlighted the following progress from the NIWGs since the February 28, 2023 NAC meeting:

- Electronic Flight Strips (EFS) are operational at three airports (CLE, IND, and PHX), with a fourth planned for late July (RDU)
- More than half of the centers are using En Route Data Communications
- Last major segment of the Atlantic Coast Routes (ACR) project implemented new high altitude PBN routes
- Joint Analysis Team (JAT) will start looking at a way to measure potential benefits of the ACR implementation

Mr. Christie identified the following presenters for the NIWG focus areas:

- Northeast Corridor (NEC) and Performance Based Navigation (PBN) – Mr. Ralph Tamburro from Port Authority of New York and New Jersey (PANYNJ)
- Surface and Data Sharing – Mr. Rob Goldman from Delta Air Lines and Mr. Doug Swol from the FAA
- Data Communications – Mr. Chris Collings from L3Harris and Ms. Kathy Torrence from the FAA

Northeast Corridor (NEC) and Performance Based Navigation (PBN)

Mr. Christie handed off to Mr. Tamburro (PANYNJ) for the joint NEC and PBN briefing.

Mr. Tamburro stated that they are actively using high-altitude routes implemented as part of the ACR effort. They expect some minor updates to a few items left to complete from the ACR effort by June 15th. This effort was a long-awaited product for the Northeast and this group looks forward to working with the JAT on the benefits that can potentially be seen for this effort. He noted that the NEC group is also actively working with the general aviation (GA) community in New York to promote some of the high-altitude sectors that were created.

Mr. Tamburro concluded his update with saying that there are no changes for the remaining implementation milestones since the February 2023 NAC meeting. He said that the airspace move in New York is currently on hold and is not sure of the impacts of the existing commitments, but will be adjusting that in the next couple meetings. He closed out by saying, all Industry commitments are complete and/or on schedule.

Surface and Data Sharing

Next, Mr. Doug Swol (FAA) and Mr. Robert Goldman (Delta Air Lines) provided an update on Surface and Data Sharing.

Mr. Doug Swol reviewed the following key TFDM updates and near term activities:

- Indianapolis (IND) achieved Initial Operating Capability (IOC) on Build 1 (Electronic Flight Strips) on May 15
    - First site to directly transfer from paper flight strips to electronic flight and Traffic Management Initiatives (TMI) data
- Phoenix (PHX) achieved IOC on Build 1 on June 5th
- Terminal Flight Data Manager (TFDM) 4th IOC at Raleigh-Durham (week of July 24th)

    - Completes another NAC milestone
- Updated TFDM waterfall planned for release in late June based on FY24-25 budget guidance
    - FAA will work with both industry and Surface NIWG to go over our decisions and review changes
- Las Vegas Collaborative Site Implementation Team (CSIT) week of June 12th
    - The purpose of this meeting is to get everyone including the program office, Sys Ops and Industry on board and understand how the surface operations will occur with Build 2 (Surface Management Tools)
- TFDM Build 2 on track for IOC in Spring 2024
    - Currently testing at FAA Tech Center

Mr. Swol handed off the Mr. Rob Goldman for industry's Surface NIWG update.

Mr. Goldman emphasized there is excitement as more people learn about the cost savings, sustainability, and the benefits that we are seeing with the implementation of TFDM. He continued with saying that the Surface NIWG industry milestones will need to align with the FAA's waterfall. Mr. Goldman noted that there are a lot of other industry activities ongoing such as engaging with Sys Ops, assisting the Collaborative Site Implementation Team (CSIT) efforts as this is a team support. He said, Surface and Data Sharing isn't about the FAA deploying systems and hardware, but there is a training aspect and integration with the operations from the stakeholders, such as airlines, airports, and business aviation. This effort has a lot of activities and requires a lot of moving parts.

The Surface and Data Sharing NIWG is always looking for ways to partner with the FAA, Mr. Goldman noted. Surface safety is a critical piece going forward and the NIWG want to leverage process technology and data any way they can to be a support to that important initiative.

Mr. Goldman continued with saying that TFDM is a program that is a tool within a suite of different tools that integrate together. He noted that during the NAC Chair's Roundtable topics, his colleagues at United Airlines (Mr. Ron Renk) and Southwest Airlines (Mr. Trey Turner) spoke about Time Based Flow Management (TBFM) which is a great example of how the surface piece of TFDM interfaces with TBFM. He noted that while it is important that we acknowledge the successes of TFDM deployment, that we don't forget about Trajectory Based Operations (TBO) or the integrations of these systems and continued deployment across the NAS.

Mr. Goldman concluded, that in order to make TBO effective and by extension info-centric NAS, we have to exchange data that comes from our operation centers, airports, and the aviation community. He hopes that we can start having more conversations about exchanging data to integrate all of these systems.

Data Communications (Data Comm)

Next, Ms. Kathy Torrence (FAA) and Mr. Chris Collings (L3Harris) provided an update on Data Comm.

Ms. Kathy Torrence began with providing the following update on En Route Data Comm deployment:

- 11 En Route centers operational 24/7
- Houston Center began testing May 10th
    - Houston Center is running initial services in limited mode while they finish Air Traffic training

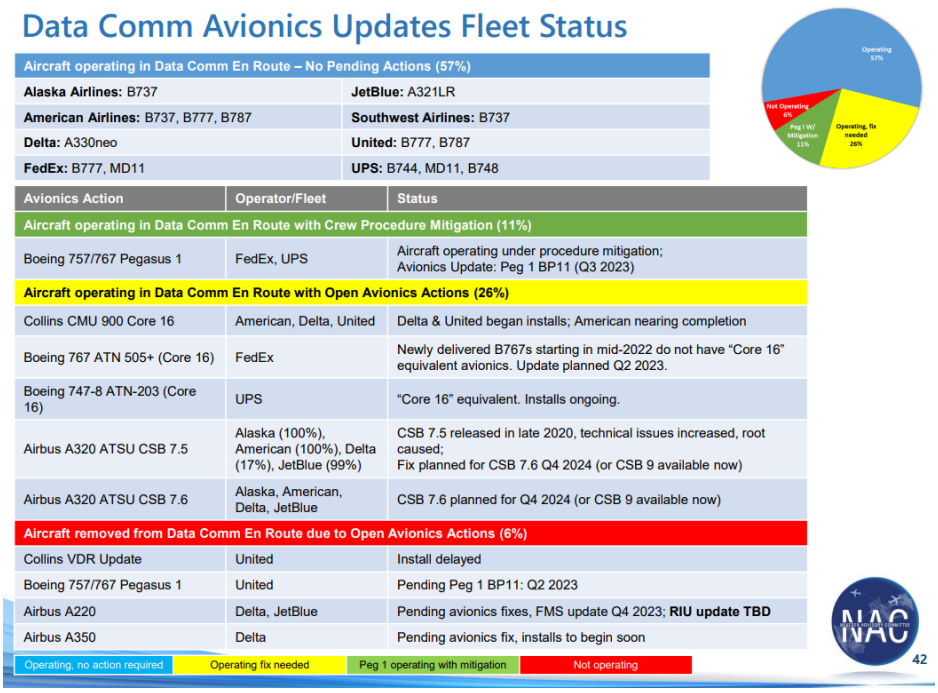
- 45,000+ controller initiated Data Comm En Route messages in a single day
- Denver has the most En Route messages
- Atlanta will declare IOC
- Controller Pilot Data Link Communications (CPDLC) is available coast to coast
- Next Air Route Traffic Control Centers (ARTCC) scheduled for En Route Data Comm deployment are Jacksonville, FL; Fort Worth, TX; and Cleveland, OH.
    - By early 2024, FAA will have En Route CPDLC available at 75% of the country
- En Route Full Services Increment 1 is active at all active centers
    - Includes block, altitudes and speed
- En Route deployment delayed due to funding constraints

Ms. Torrence provided some insight into the partnership that the FAA has with Industry. Recently the FAA reached out to their industry partners for help identifying and analyzing a few issues they ran across when new ARTCCs become online. The FAA received help and partnered with operators such as JetBlue Airways, Southwest Airlines, United Airlines, and American Airlines, as well as help from the original equipment manufacturers such as Airbus and Collins Aerospace.

Ms. Torrence concluded her remarks with sharing that at the last Data Communications Implementation Team (DCIT) meeting, the FAA presented a plan to get business and general aviation operators back into En Route CPDLC by the end of summer 2023.

Ms. Torrence handed off to Mr. Chris Collings to provide an update on avionics.

Mr. Collings reviewed the following tables and graph which show the Data Comm avionics fleet status. He stated that we will see the "Aircraft Operating in Data Comm En Route" increase after the summer flying season, as Boeing is rolling out their fix for Pegasus 1. He said optimistically they are expecting the "Aircraft Operating in Data Comm En Route" section to grow to 75% by the end of the year. Mr. Collins noted that they are still awaiting an update on the Airbus A220 avionics fixes



Data Comm Avionics Updates Fleet Status

Aircraft operating in Data Comm En Route – No Pending Actions (57%)	
Alaska Airlines: B737	**JetBlue:** A321LR
American Airlines: B737, B777, B787	**Southwest Airlines:** B737
Delta: A330neo	**United:** B777, B787
FedEx: B777, MD11	**UPS:** B744, MD11, B748

Avionics Action	Operator/Fleet	Status
Aircraft operating in Data Comm En Route with Crew Procedure Mitigation (11%)		
Boeing 757/767 Pegasus 1	FedEx, UPS	Aircraft operating under procedure mitigation; Avionics Update: Peg 1 BP11 (Q3 2023)
Aircraft operating in Data Comm En Route with Open Avionics Actions (26%)		
Collins CMU 900 Core 16	American, Delta, United	Delta & United began installs; American nearing completion
Boeing 767 ATN 505+ (Core 16)	FedEx	Newly delivered B767s starting in mid-2022 do not have "Core 16" equivalent avionics. Update planned Q2 2023.
Boeing 747-8 ATN-203 (Core 16)	UPS	"Core 16" equivalent. Installs ongoing.
Airbus A320 ATSU CSB 7.5	Alaska (100%), American (100%), Delta (17%), JetBlue (99%)	CSB 7.5 released in late 2020, technical issues increased, root caused; Fix planned for CSB 7.6 Q4 2024 (or CSB 9 available now)
Airbus A320 ATSU CSB 7.6	Alaska, American, Delta, JetBlue	CSB 7.6 planned for Q4 2024 (or CSB 9 available now)
Aircraft removed from Data Comm En Route due to Open Avionics Actions (6%)		
Collins VDR Update	United	Install delayed
Boeing 757/767 Pegasus 1	United	Pending Peg 1 BP11: Q2 2023
Airbus A220	Delta, JetBlue	Pending avionics fixes, FMS update Q4 2023; **RIU update TBD**
Airbus A350	Delta	Pending avionics fix, installs to begin soon

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

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Mr. Collings reiterated what Ms. Torrence said about the strong engagement and positive progress they are seeing at the DCIT. He mentioned that a few of the Data Comm NIWG members expressed some concerns about the Enhanced Services baseline, which includes the extras and the final baseline package, slipping to end of 2029. He mentioned that this milestone has moved several times to the right; however, Full Services is set to be deployed in the next couple years. He concluded that since the milestone has slipped to 2029, it creates a gap in capabilities deployment beyond the roadmap.in its current state.

Mr. Christie requested for the Data Comm NIWG to provide an estimated timeline on Airbus A220 avionics fix at the next NAC meeting. He mentioned that there have been 'TBD' for this fix since the last two NAC meetings.

Mr. Collings said he was hoping to have an update by the June NAC meeting, but unfortunately they had to leave the update as TBD. This item is something they will continue to stress in the Data Comm monthly meeting and ad hoc meetings, but will certainly ask Airbus.

NAC Subcommittee (SC) Chair's Report – NAC Tasking Update

NAC Tasking 23-1: National Airspace System Airspace Efficiencies

Ms. Lee Brown began by introducing the NAC Task 23-1 NAS Airspace Efficiencies leadership team which includes herself, Mr. Ron Renk, and Mr. Shawn Kozica (FAA). Ms. Brown provided a high-level overview of the NAC Tasking elements that the group is looking at.

She continued by saying that the big part of what this team needs to determine is if they have the right procedures, where do they have procedures that they don't need, and what procedures are being under-utilized. She noted that this is an important item not just in terms of what it takes for the FAA to maintain the procedures, but from an operator perspective they have to train their pilots to use the procedures they have in the system.

Ms. Brown then handed it to Mr. Kozica to present the FAA outlook on this tasking.

Mr. Kozica highlighted the value and benefits of this tasking. He pointed out how the tasking was deliberately worded to provide the NAC the opportunity to be creative with the approach. He said there is a lot of value in this tasking, not just what the airspace might not need, but also looking to make better use of what we do have. He continued by saying it is one thing to say we don't need any of these procedures, but it's another to put definitions around it. He noted this is the value the FAA is looking for from this tasking as we continue to progress from NextGen to Info-Centric NAS.

Mr. Kozica also noted that determining the minimum amount of procedures needed for aircaft that are not equipped, will help inform the FAA's investment going forward. He said the more we can shed costs from the Legacy NAS, the more we can spend on modernization.

Ms. Brown followed up Mr. Kozica with providing details on the task schedule and overview. She referenced back to the February 28th NAC meeting where they said their approach is going to go with case studies. She said the idea is to select case studies to try to find things that are represented across the board then as they look into each of the specific sites, they can pull together some consensus items. They hope to also identify things that are unique or specific to types of airports or operations.

She noted in March 2023 they selected Fort Lauderdale-Hollywood International Airport (FLL) for the initial site study. This site was selected because it had a lot of operator variability, with consideration to size and infrastructure along with operators and aircraft. The group also factored in the work already done at FLL by the FAA – the type of data, what was used and what is available. Ms. Brown said that the group wants to make sure they are able to look at the NSG 3, 4 and 5 airports not just NSG 1 and 2 commercial airports.

Mr. Brown continued to note that the group originally expected to have several months to complete the case studies, however, it has taken them longer to finish the initial study and build out the questions. Ms. Brown said that this group is in conversations with the FAA on a potential tasking extension to allow them to get through all the case studies. The group has made adjustments in order to be prepared for an interim presentation at the October NAC.

Ms. Brown handed it back to Mr. Renk to present how they plan to use the data about the airports selected for the case study

Mr. Renk started by explaining that the FAA's IOAA tool collects data, looks at controller voice clearances to determine a number of times a particular arrival, and if an approach or departure have been used. He noted that this is very objective data that shows how many times a procedure is used at a particular airport. He said that the team felt that there was subjective-ness that needed to come along with this process.

Since the last NAC, the team began working on a process that looks at both the objective nature of how many times a procedure is used and subjective nature of why that procedure exists. Mr. Renk said in this process, they are including notional minimum levels of service based on the airport NSG category and a comprehensive list of other considerations that need to be given if IFPs are to be removed. The group is also trying to include notional minimum levels of services which they are going to use the PBN NAS NAV Strategy documents to guide some of those discussions. Mr. Renk provided the example for a NSG-1 airport there should be minimum expectation from the FAA. He said there should probably be a departure procedure, arrival procedure, and approaches. He mentioned in those approaches there should be redundancies. He said they want ground-based stuff for when GPS is jammed and GPS stuff for when ILS is out of service. He noted for the bigger airports there should be a notion that says this is the minimum level of service.

Mr. Renk then provided the below table which is the list of the subjective items the group identified and will not use them to apply to their first case study, FLL. He said that some of these items maybe get eliminated, defined, refined and added as they work through their first study.

Process Worksheet Overview

Airspace Constraints	**Airport Planned Changes (New runways, Construction, Closed areas)**
Runway Configuration/Airport Layout	**Types of Operations (flight training/air ambulance/etc.)**
Common Weather Patterns (Foggy, low vis, etc.)	**Operation Peaking/Limitations Due to Throughput**
Airport Lighting Consideration	**Military Presence (type of operations, fleet mix, etc)**
Terrain Contraints/Obstacle Constraints	**Procedure Constraints (arrival to approach connections)**
Noise Constraints/Airfield/Flight Procedure Environmental Review Currently Underway	**Special Events held at/near airport**
Operational Trial Activities/Potential Activities	**Contingency Procedures (ATC assigned only)**
Controller Tools Available	**User Requested Approaches**
Fleet Mix (aircraft types/fixed wing/ helo/etc.)	**ATC Resources**
Operator Mix	**Redundant Procedures (direction/equipage/etc.)**
Equipage Levels	**Procedures that are designed but don't work in the airspace**

Mr. Renk then noted that they are about 50% complete with FLL case study. The group is hoping to wrap up the subjective pieces of the process for the procedures at FLL and identified the following airports for additional case studies:

	DEN	LAX	DFW, DAL, ADW	LGA, JFK, EWR, TEB, HPN	BNA
NSG 1?	X		X	X	
Lots of procedures?	X	X	X		
Redundant procedures?	X		X	X	
Limited PBN?				X	
Under- or well-utilized?	X	X			X
More than one airport?			X	X	

*DEN (Denver International Airport); LAX (Los Angeles International Airport), DFW (Dallas-Fort Work International Airport), DAL (Dallas Love Field); ADW (Andrews Air Force Base); LGA (LaGuardia Airport); JFK (John F. Kennedy International Airport); EWR (Newark Liberty International Airport); TEB (Teterboro Airport); HPN (Westchester County Airport); and BNA (Nashville International Airport)

Mr. Renk continued by saying that the team wants to make sure that they pick from these airports to get as many attributes as possible to run through the process they are developing. He reiterated Ms. Brown's comments that they are targeting initial findings for the October 2023 NAC meeting with a request for an extension.

Mr. Renk opened the floor for questions:

Mr. Childs asked a high-level question - Given the task does not include the scope of evaluating the bottom third of the NAS and all the mass inefficiencies there, is the task progressing on that at all? Or is it just capitalizing opportunities? I'm talking about the ones that are obsolete (legacy type VORs) is this task progressing on that at all?

Mr. Renk replied, yes, but not from a high level. There are ongoing programs that are going to change inventory, but not necessarily addressing anything unless the approach is directly related to FLL.

Mr. Childs noted that we are talking about funding. He asked what we need to do to give the resources to the FAA to keep progressing. He continued with the need to recommend something to the FAA to get rid of the legacy procedures so the FAA can spending on other priorities. He said at the end of this meeting, we're going to say we need to be equipped and the FAA needs to be equipped.

Mr. Arel provided some remarks in response to Mr. Childs. He said let me elaborate on that: first issue - we need a certain viable network of surface radar technology, we still need those VORs if say we have any loss of GPS services, so we need that. He continued with saying one of the bigger challenges is the entire inventory of approaches have become untenable, just the maintenance of it doing a quality assurance check, flight check, and all the procedures it takes every year to maintain the approach has become unaffordable. He said one of the FAA's desires is to get the MCL in every airport. We don't need 12 different approaches for the same runway, and that's what we have out there. We could free up a lot of money if we could at least get to that MCL at the same time, reducing inventory. It is a balance challenge, but we do see an opportunity here for a significant cost savings and being able to direct our resources elsewhere. So it is eliminating some of the older stuff.

Ms. Thomson said it seems like input from the NAC would be helpful. Start with the top-end of the funnel - where are the greatest opportunities and impact, and funnel out what we can't get rid of because the military is depending on it, but don't sub-select the first thing, look at all the opportunities, pros/cons, and whether it's even possible to get rid of, eliminate, and/or streamline some of these things, then we can identify where the greatest opportunities.

Mr. Renk said that's exactly what this process is supposed to do. Every IFP we look at will go through that list and stuff will get weeded out. If we can't justify its importance, or even if it's justifiable, we will question if it really is. This gives a chance for everybody and gives it a holistic look – why are we keeping this inventory and figuring out if we really need it.

Ms. Brown said that Industry will give recommendations and hope to come up with a repeatable and scalable process.

Ms. Thomson said that is where we want the investment – get rid of the 'extra' stuff, allowing more resources to build the procedures needed to support.

Mr. Childs said that this was a great task and mentioned that if we don't have an understanding of what we do with what we don't need, we're never going to get what we want. He asked - Is all this mostly political or legal?

Ms. Thomson replied saying that this is mostly political.

Mr. Kozica noted that it is also an investment decision. He said that you have to invest fast. He continued saying that understanding where the best opportunities are will allow us to allocate the funds, getting the 'best bang for our buck' in return.

Mr. Christie made the recommendation to look into this more at the Subcommittee meetings. He recommends to build a template, apply it to FLL and perhaps other selected airports, and provide a recommendation specific to FLL, and based on that work, what would fall out.

Mr. Childs said everyone here at this table, wants something and that they have to be ready to give something up, in order to evolve. He noted that we have to evolve and that we are in the political economical construct, so if you want all this stuff, we have to give stuff up.

Mr. Renk followed up by saying that this is a conclusive list, including a large cross section of aviation, so there shouldn't be much missing that people will come back and complain about.

Mr. Kozica said he thinks it's a recognized shared challenge and everyone is 'playing'. He said the desired end game is advice that we can use on a national scale. He said the case studies are examples to help us get there, as we go forward, this is our baseline, at a minimum, this is the type of stuff we should have to provide at these levels of service.

Ms. Thomson recommended that the NAC also establish public narrative, whether it's Congress or the general public in terms of why, in a straight forward way that we can all understand.

Mr. Childs concluded this discussion saying this is good stuff.

FAA Topics

Mr. Child then handed to Ms. Thomson for the FAA Topics section.

Before handing off to the Section 547 Team, Ms. Thomson picked up on a topic that was discussed earlier in the meeting – funding. She said that it's exciting to see proposal from both the House and Senate on FAA Reauthorization, but what is noticeably absent is any attempt to grapple with funding needs across the agency. She continued by saying the FAA is looking into additional opportunities to make a case for the FAA Reauthorization. She encouraged all of the NAC Members to highlight the FAA's core issues during their conversations on the Hill.

Section 547 Pilot Program

Ms. Thomson handed off to Mr. Juan Narvid (FAA) and Ms. Torrence for a Section 547 Pilot Program update.

Mr. Narvid began by providing an update on Section 547 which comes from the 2018 FAA Reauthorization Act. He noted that the goal of the pilot program is to demonstrate the benefits of NextGen programs. He noted the following three selected Section 547 initiatives:

- Simultaneous independent established on RNP (EoR) at Los Angeles International Airport (LAX)
- CPDLC Departure Clearance (DCL) capabilities at Orlando International Airport (MCO)
- Automatic Dependent Surveillance-Broadcast (ADS-B) Out enabling 3 nautical mile (NM) in En Route airspace for Oakland Air Route Traffic Control Center (ZOA)

Mr. Narvid explained that at LAX, they measured the benefits to be able to use separation standards, the equipment on the aircraft, and the pilot's capability to fly RNP AR with an RF turn. He said they then compared it to other approaches coming in from the West. He noted that there was an average over 500 approaches every month. The following table show the flight efficiency improvements for RNP RF verses non-RNP approach operations per flight.

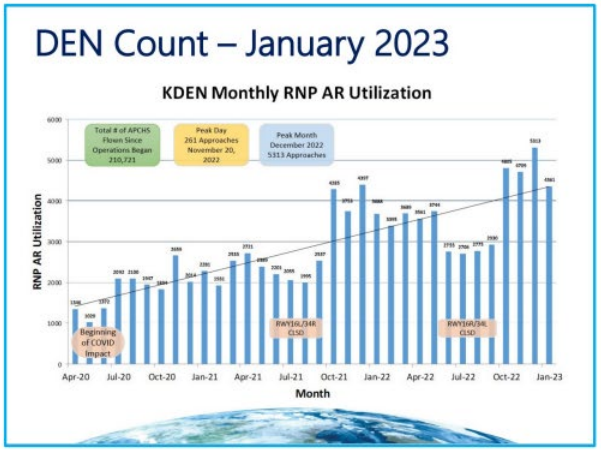
Flight Efficiency Improvements for RNP RF vs Non-RNP Approach Operations

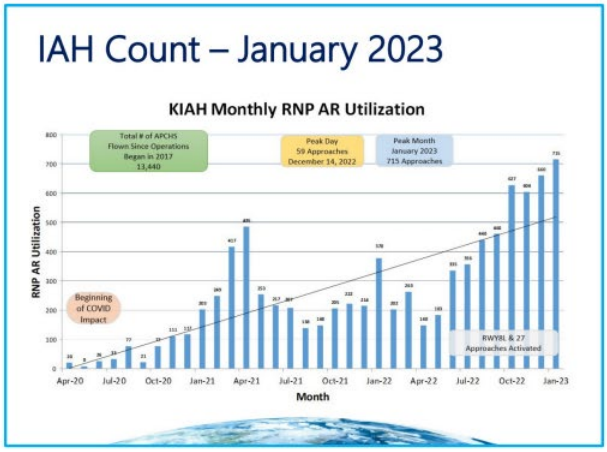
	Savings per Flight			
VMC/IMC	**Distance Flown (NM)**	**Time Flown (Minutes)**	**Fuel Burn (Gallons)**	**CO_2 Emissions (kgs)***
VMC	**2.5**	**0.8**	**9.1**	**81.0**
IMC	**6.6**	**2.1**	**20.2**	**174.5**

Mr. Narvid provided the following cumulative RNP benefits from September 14, 2021 through March 31, 2023

- Saved 36,200 NM distance flown
- Saved 11,200 minutes of flying time
- Saved 1.1 million kilograms of CO_2 emissions

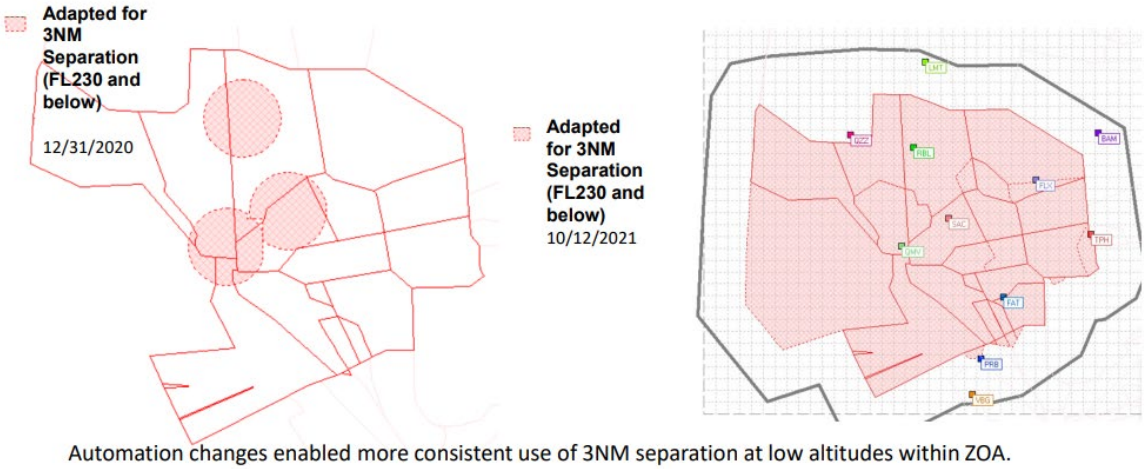
Next, Mr. Narvid shared the following graphs which show the monthly RNP AR utilization at Denver International Airport (DEN) on the left and George Bush Intercontinental Airport (IAH) on the right. He said at IAH they continue to see over 500 utilization a month and at DEN there are over 5,000 approaches used a month.





Next, Mr. Narvid discussed the Oakland initiative where ADS-B Out is being used to reduce the separation from five to three nautical miles (NM). He shared the following graphic which shows what spacing looked like prior to the use of ADS-B Out and what it looks now since adapting 3NM separation.

Reduced Separation from 5NM to 3NM using ADS-B Out Equipage

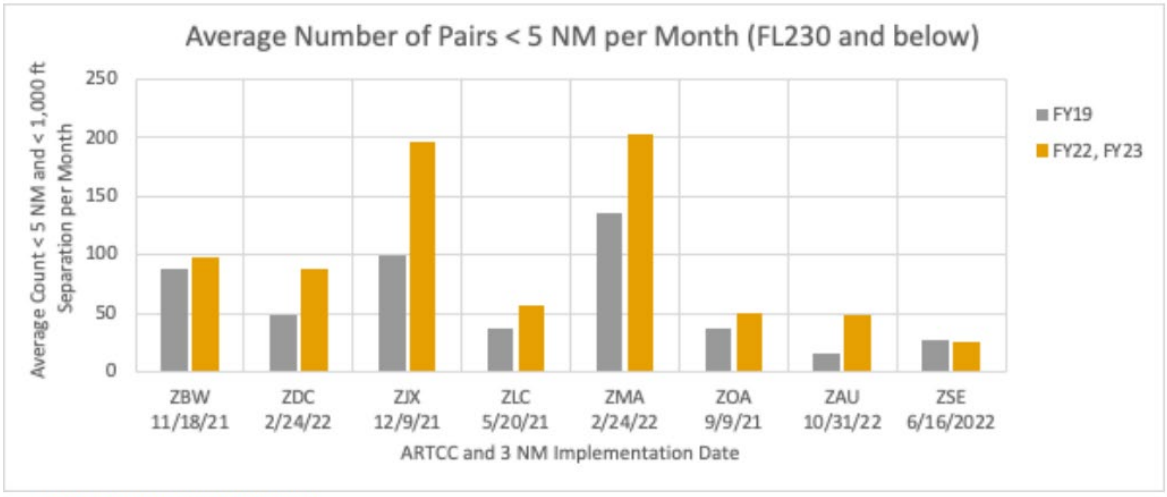


Automation changes enabled more consistent use of 3NM separation at low altitudes within ZOA.

He noted some of the benefits include air traffic controllers seeing uniformity of applying this to an entire airspace, the safety aspect of not having to switch from 5NM to 3NM or 3NM to 5NM, and that pilots avoid excess vectors.

He shared the following bar graph which shows the average count of less than 5NM separation per month for all of the ARTCCs with 3NM separation implemented. He highlighted the numbers at ZDC (Washington ARTCC), ZJX (Jacksonville ARTCC), and ZMA (Miami ARTCC) which had the most significant amount of less than 5NM separation opportunities increase.

All ARTCCs with 3NM Separation Implemented

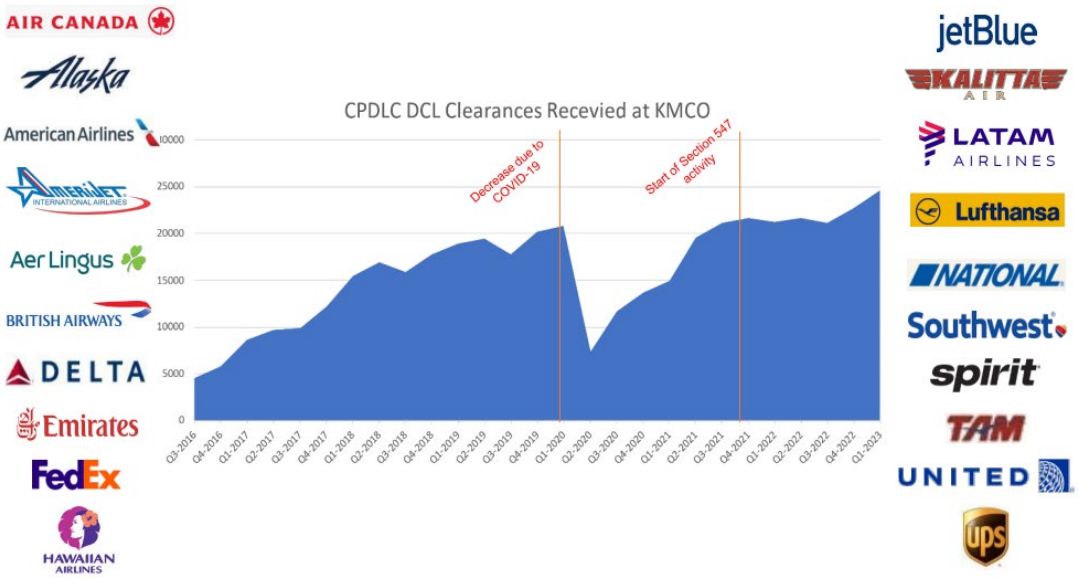


Note: Includes some VFR aircraft

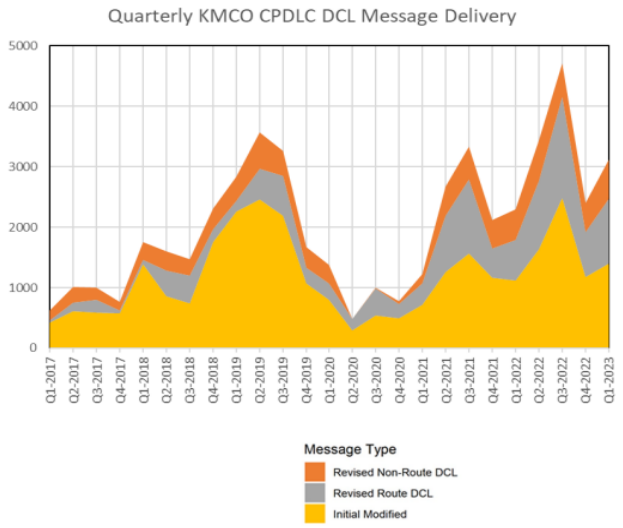
Mr. Narvid then handed off to Ms. Torrence to provide the status update of CPDCL at Orlando International Airport (MCO).

Ms. Torrence started by saying that they see the most benefits when the equipped operators get revised departure clearances due to weather or other air traffic conditions. She noted that the anticipated benefits are minutes of airspace user time saved and kilograms of CO2 emission prevented.

Ms. Torrence shared the following graphic which shows the CPDLC DCL clearances received at MCO and the airlines that are primarily using these clearances. This graphic also shows the dip in clearances used during COVID. She noted that Q1 of calendar year 2023 shows that they are back up and not only breaking records in En Route but also breaking records for departure clearances out of Orlando. Ms. Torrence said in April 2023, there were about 8,900 clearances that were given from Orlando airport and said that the main operators were Southwest, Delta, followed by JetBlue. The aircraft type most commonly given DCLs were the Boeing 737s.



Ms. Torrence shared the following chart which shows CPDLC DCL messages delivered. She noted that the main benefits come from the revised clearances which spikes in the summer.



Cleared as Filed	The participating flight receives no changes/modifications to their original/intended route of flight filed in their flight plan.
Initial Modified	The participating flight receives a change to their original/intended route of flight on the filed flight plan, this change could be a route or non-route change.
Revised Route DCL	The participating flight receives a change/modification to their original/intended route of flight on the filed flight plan that resulted in a route change from air traffic control.
Revised Non-Route DCL	The participating flight receives a change to their original/intended route of flight on the filed flight plan. This change/modification only affected non-route information such as, but not limited to, squawk code or departure frequency.

Ms. Torrence concluded her update reviewing the benefits of CPDLC DCL. She noted that in February 2023 there were 7,500 flight cleared, 1,307 minutes of airspace user time saved and approximately prevented 29,000 kg of CO2 emissions saved.

Ms. Torrence then handed off to Mr. Childs.

Closing Comments and Adjourn

Before closing, Mr. Childs said that it will be interesting to see where some of the stuff ends up between now and October 4th. Mr. Childs' overall closing comment is that industry needs to equip and they need to make sure that the FAA is equipped as well. He asked that in the next couple of weeks for the members to make sure the FAA has consistent funding for NextGen projects.

Without any objections, the meeting was concluded.

NAC Meeting

June 12, 2023

Opening of Meeting

Chip Childs, NAC Chair

President & CEO (SkyWest Airlines)

Opening Remarks

Polly Trottenberg, Acting FAA Administrator

Public Meeting Announcement

NextGen Advisory Committee (NAC)

June 12, 2023

Public Statements

Members of the Public

NAC Chair Report

Chip Childs, NAC Chair

President & CEO (SkyWest Airlines)

Motion for NAC Approval

- February 28, 2023 – NAC Meeting Summary Package Draft

FAA Report

Katie Thomson, Delegated NAC Designated Federal Officer (FAA)

FAA Report

Tim Arel, Chief Operating officer, Air Traffic Organization (FAA)

FAA Report

Jodi Baker, Deputy Associate Administrator, Aviation Safety (FAA)

Chair's Roundtable Discussion: NextGen In Denver

Chip Childs, NAC Chair

President & CEO (SkyWest Airlines)

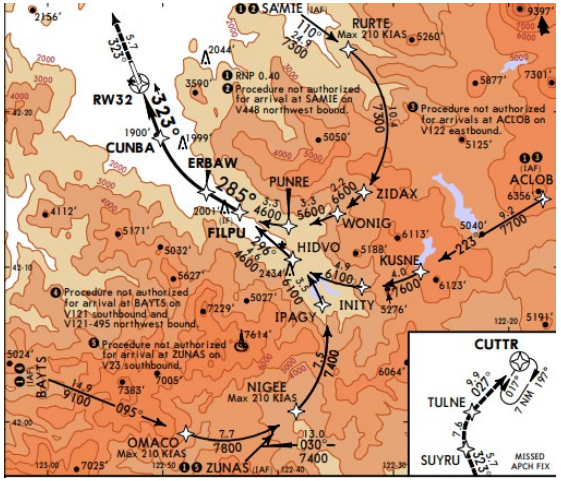
NextGen at DEN….
What's the Big Deal?

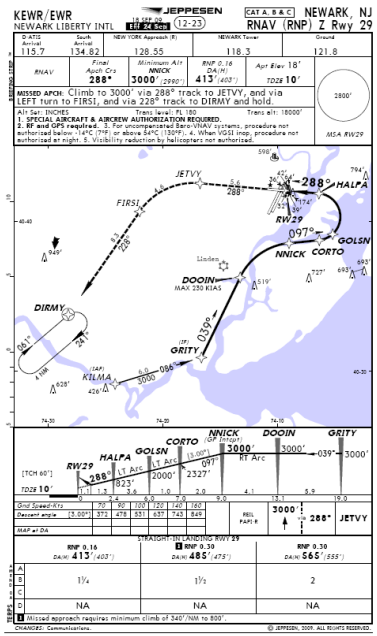
Ron Renk

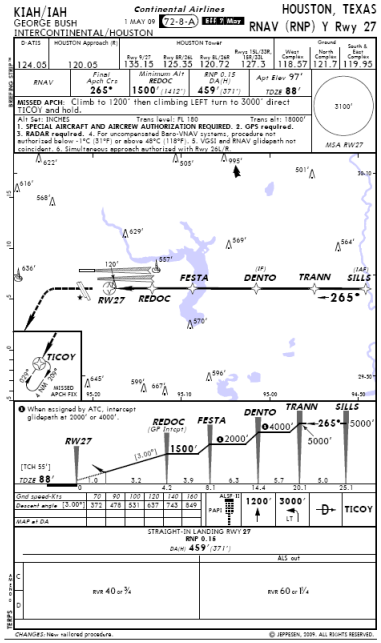
5/22/2023

How Did We Get to EoR at DEN?

- **Four fundamental cases where we see benefits for Spaced Based approaches today:**
  1. Efficiency and Carbon Reduction = DEN, IAH, LAX
  2. Terrain constrained airports. Example = MED, EGE
  3. Airspace constrained airports. Example = EWR, DCA
  4. Self-contained approach, Redundancy for busy hub operations. Example = All Hubs, PTKK, PTPN

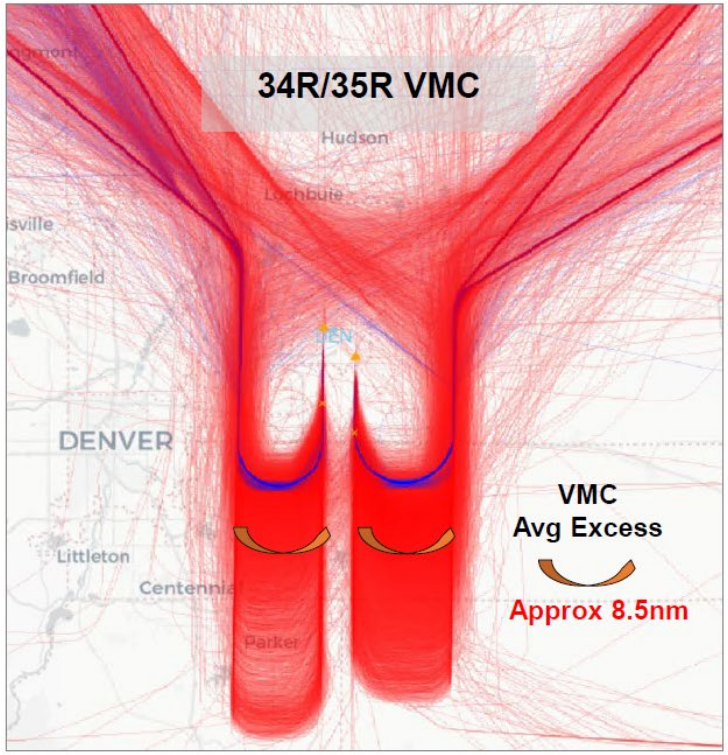


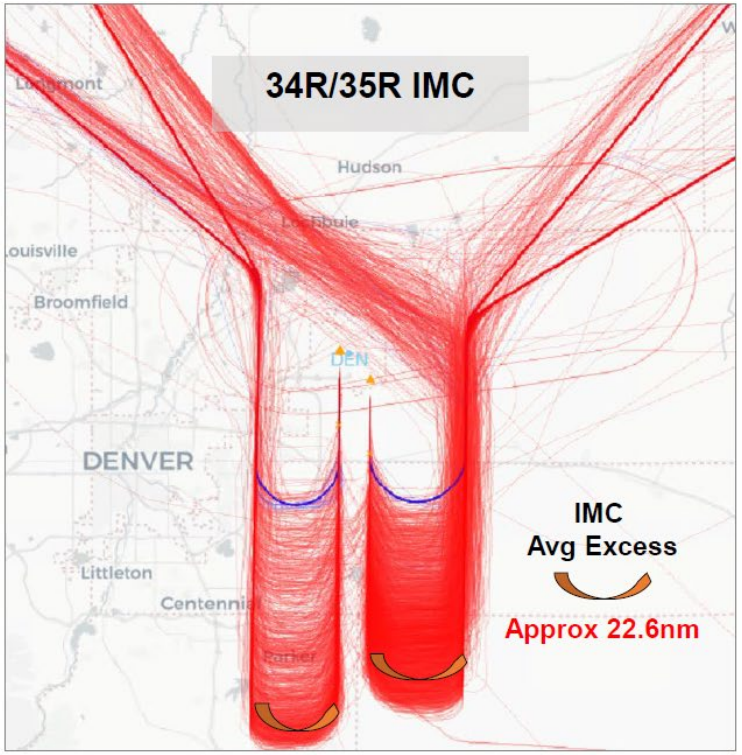




Honorable Mentions for EoR

- Hub improvements – Schedule reliability, fuel efficiency, carbon reduction, and throughput:

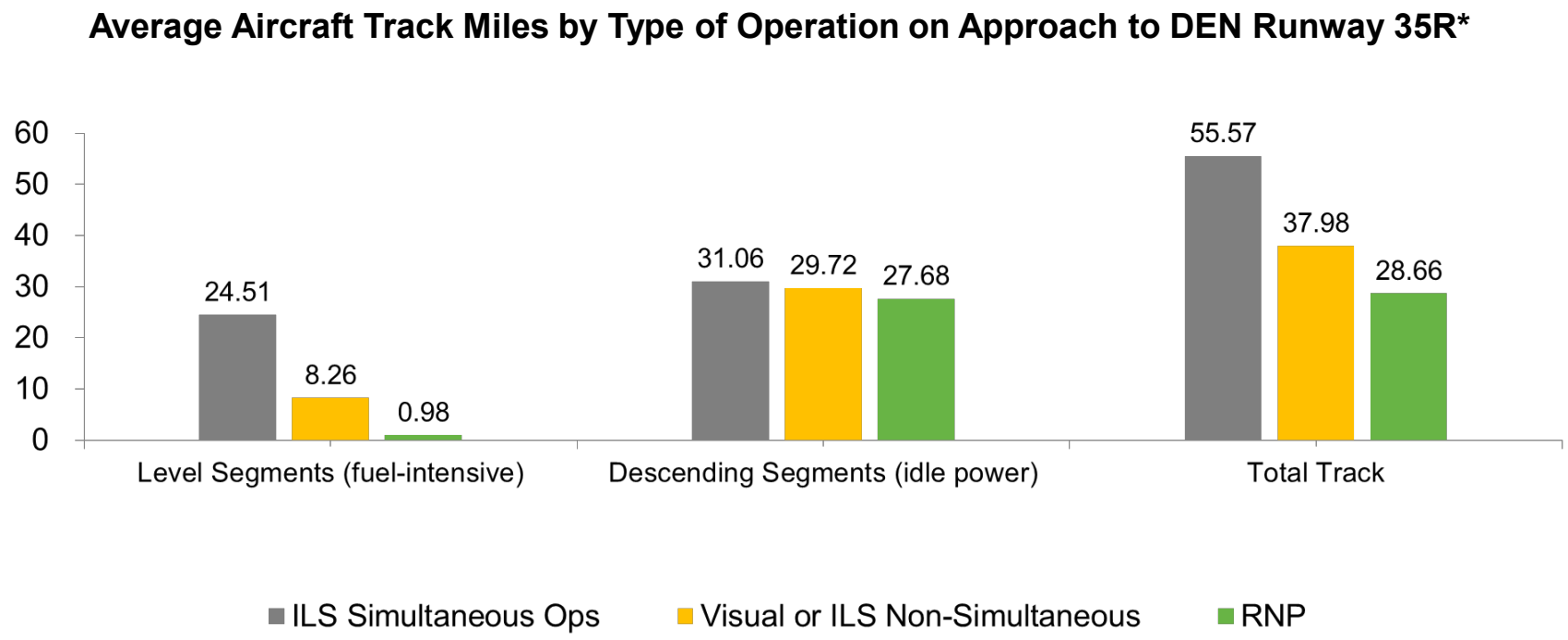




UNITED

Honorable Mentions for EoR

- Hub improvements – Schedule reliability, fuel efficiency, carbon reduction, and throughput:



Honorable Mentions for EoR

- Hub improvements – Schedule reliability, fuel efficiency, carbon reduction, and throughput:

RWY35R Downwinds OCT 2021

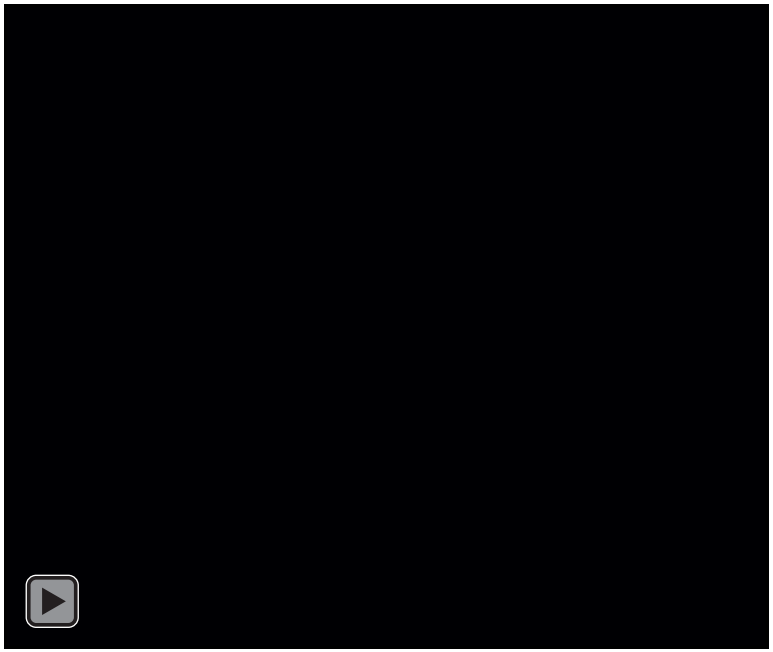
RWY35R Approach Direction	RWY35R Approach Assigned	WX Below 5000 CIG 5NM VIS	WX Above 5000 CIG 5NM VIS	RWY35R Total Flights	All Flight		Level Flight	
					Avg Miles Flown	Std Dev of Miles Flown	Avg Miles Flown	Std Dev of Miles Flown
Downwind	**RNP**	**7**	**540**	**547**	**13.24**	**0.11**	**1.46**	**1.97**
	Visual	76	1156	1232	20.14	4.98	8.01	5.57
	ILS 5-9-7 SIMOS	58	65	123	38.43	5.24	25.90	7.62

Carrier	Proportion RNP Equipped	# Downwind Flights with RNP Equipage	# Downwind Flights that Flew RNP Turn	RNP Success Rate for Downwind Flights			
				Overall	High	Medium	Low
100% Equipped	100%	31,066	14,625	47.1%	16.9%	47.6%	72.3%
Non-100% Equipped	54.8%	27,904	7,580	27.2%	10.4%	31.0%	47.5%

UNITED

Honorable Mentions for EoR

- **Left Video** – Ability to take advantage of unused slots in IMC at DEN
- **Right Video** – More Equipage means more EoR

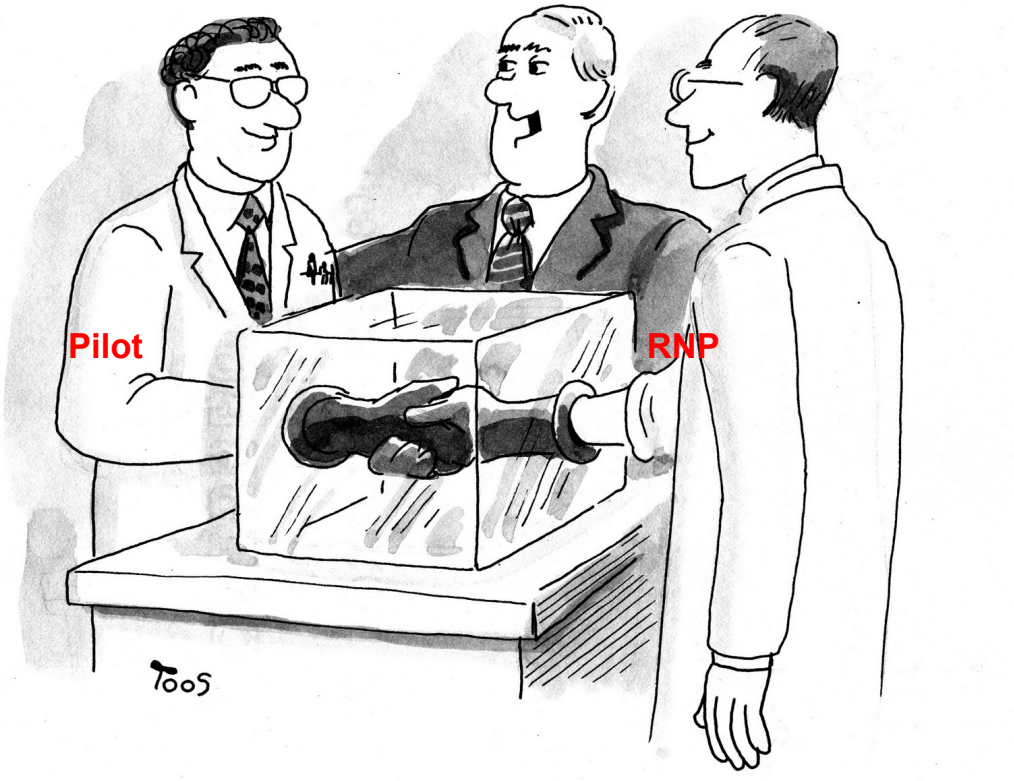


Lessons Learned and Application

- **More Pilot training and use needed to get proficient**
  - Pilots properly close discontinuities
  - Stay on downwind in worst case scenario
  - Use of route 2 or secondary flight plan

- **Better Controller understanding of pilot/aircraft limitations on RNP approaches**
  - No last minute requests for RNP
  - Vectors instead of re-joining STAR when pulled off STAR

Pilots and EoR



"I'm glad you two have finally met."

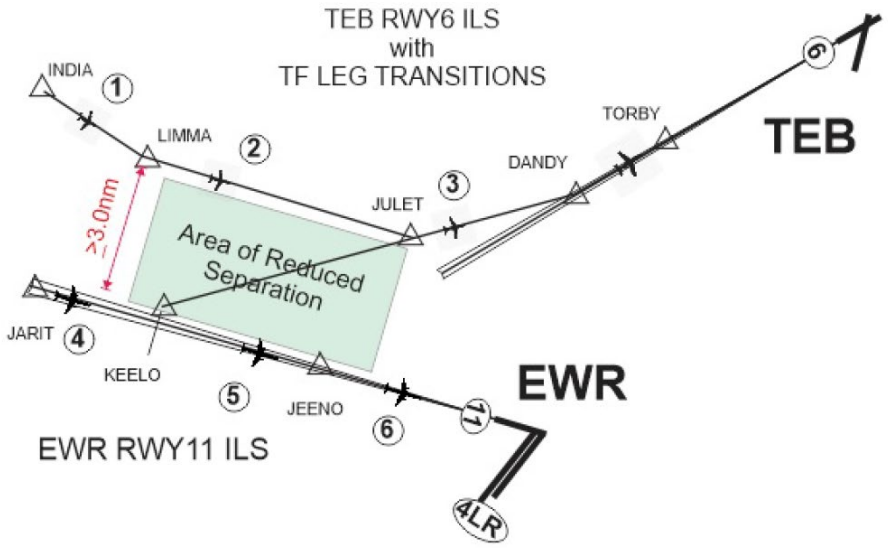
What's Next With RNP AR?

- **Temperature Compensation in FMC/FMGC to improve consistent vertical path**

- **Need More controller tools and automation**
  - Terminal Sequencing and Spacing (TSAS)
  - Trajectory Based Operations (TBO)

- **New EoR rules for less than widely spaced**

- **Multiple Airport Route System (MARS)**



UNITED

TBFM Main Capability Use at Denver Center (ZDV)

- Single Center Metering (SCM) at Denver Center – manages metering internal to ZDV
- Adjacent Center Metering (ACM) – extension of SCM to ZLA
- Constraint Satisfaction Point (CSP) – a meter arc or fix or other meter reference element
- Coupled Scheduling (CS)/Extended Metering (XM) – adds additional CSPs for an aircraft to meet the scheduled time of arrival along their routes, This results in a more optimal distribution of delays over a greater distance from the airport or the CSP
- En Route Departure Capability (EDC) – scheduling capability that assists in formulating release times to a miles in trail restriction
- Departure Scheduling – obtains a release from TBFM to schedule into an arrival flow
- Integrated Departure/Arrival Capability (IDAC) – Capability allows the ATCTs to conduct departure scheduling electronically (on the waterfall)

This is a Team Effort!!

UNITED

DEN NextGen Highlights

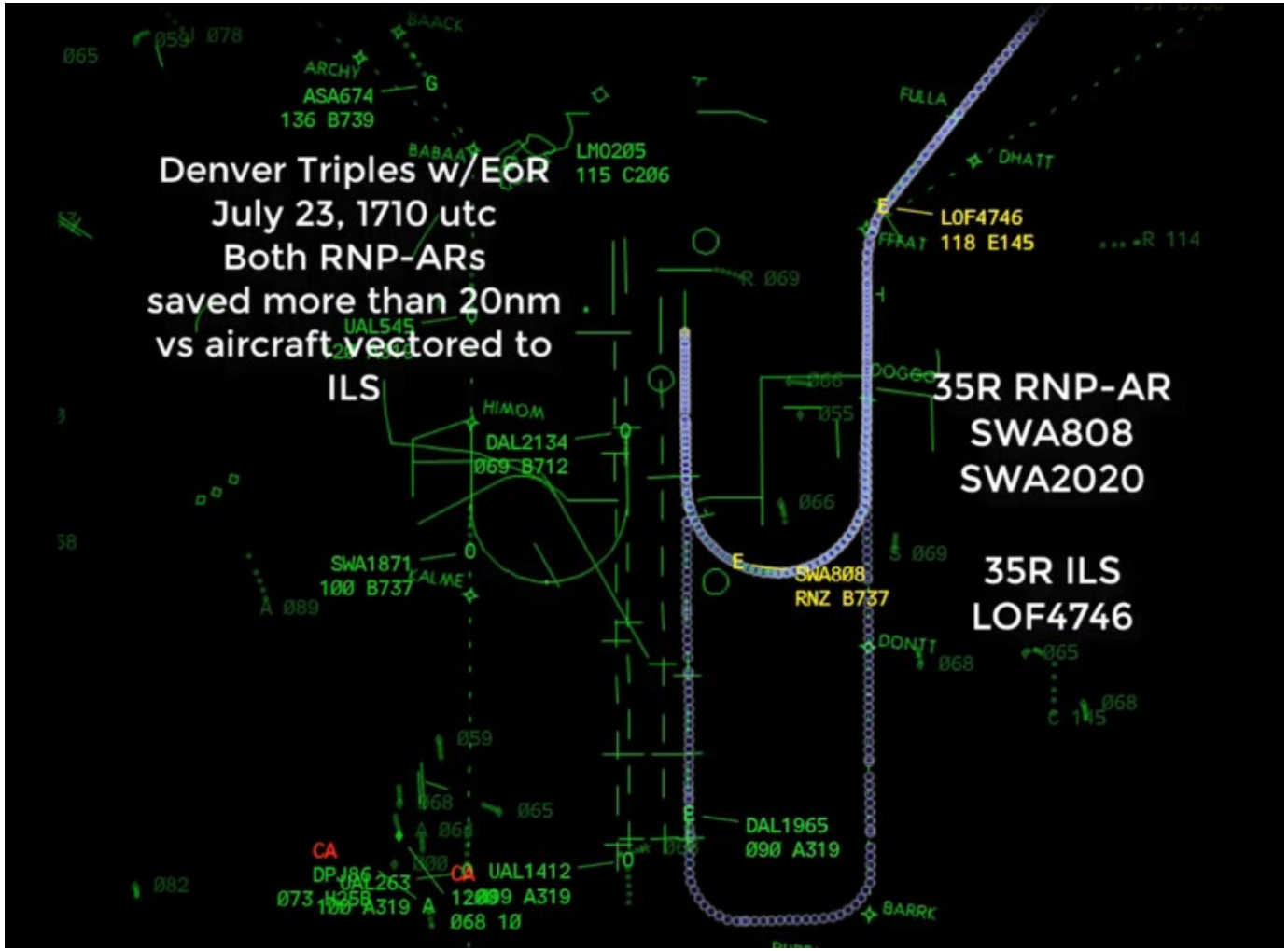
June 12, 2023 NAC Meeting

Southwest Airlines Air Traffic Management and Flight Operations Technical

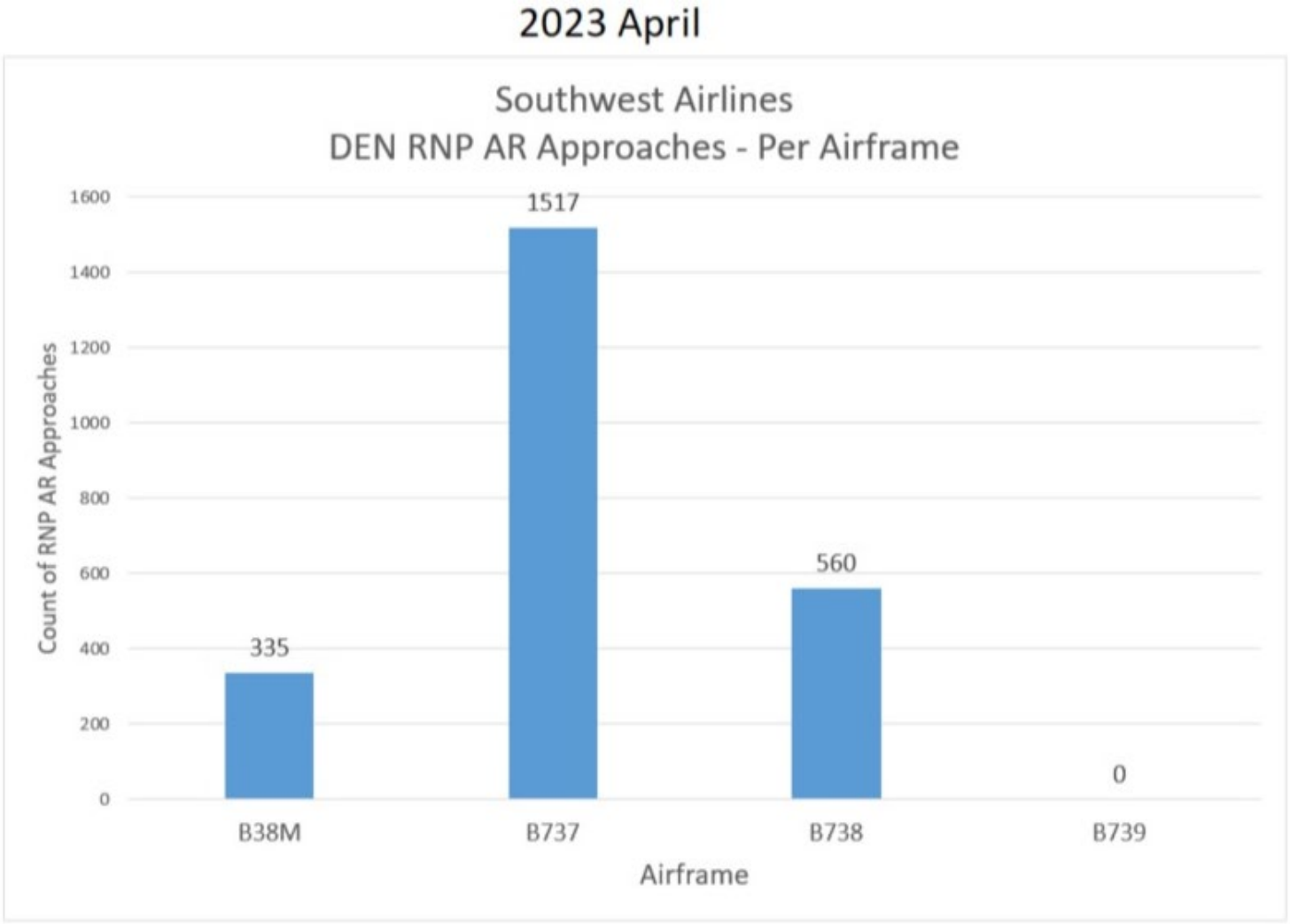
The NextGen story unfolding at DEN…

- ❑ RNP Utilization
- ❑ DataComm DCL
- ❑ Time-Based Flow Management (TBFM)

Key Development for RNP initiative – DEN laid the national foundation for EoR

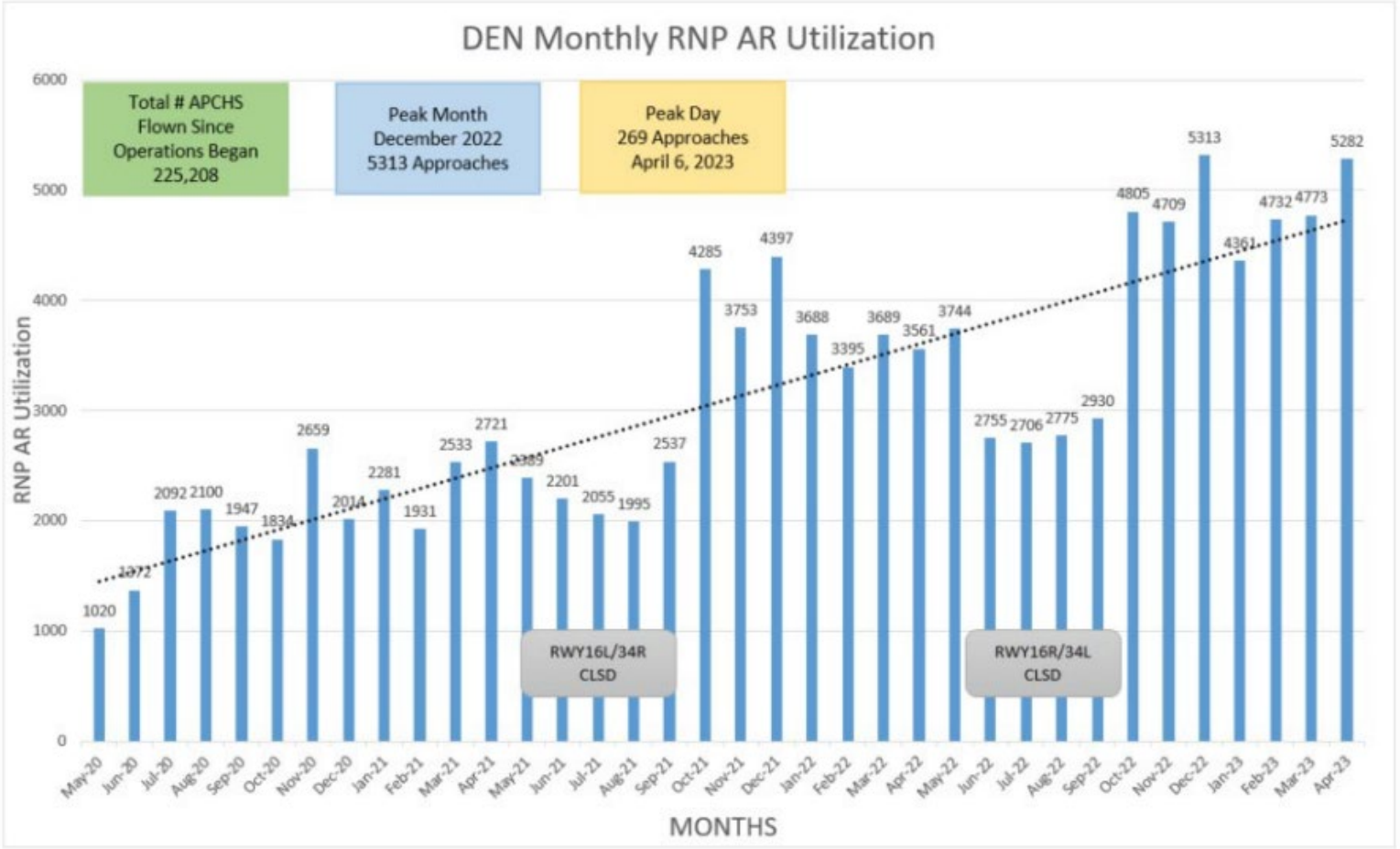


RNP Advancement – New rules and innovative minds at D01 bringing greater efficiencies



Encouraging trends….

DEN Count – April 2023



RNP Utilization – can you say sustainability?

RNP Benefits and Utilization April 2021 to March 2023 – how might we drive these numbers up without TSAS?

DEN

Level		
KDEN	RNP Av Time from 40 nm out to TD (m)	13.8
	non RNP Av Time from 40 nm out to TD (m)	13.0
	Average Time Savings/Loss (m)	1.1
	Total Time Savings/Loss (m)	25,604.2
	RNP Avg GTD from 40 nm out to TD (nm)	59.9
	non RNP Avg GTD from 40 nm out to TD (nm)	54.6
	Average GTD Savings/Loss (nm)	4.1
	Total GTD Savings/Loss (nm)	98,968.3
	RNP Avg Fuel from 40nm out to TD (lbs)	542.5
	non RNP Avg Fuel from 40nm out to TD (lbs)	547.7
	Average Fuel Savings/Loss (lbs)	83.0
	Total Fuel Savings/Loss (lbs)	1,984,396.5
	% RNP	16.2%
	RNP Flight Count	23,910
	non RNP Flight Count	123,369

DEN CPDLC DCL Benefits for SWA

February 2022 to February 2023

Cleared 86,823 flights

Saved 22,234 minutes of airspace user time (gate and taxi)

Prevented 926,717 kgs of CO_2 Emissions

In February 2023

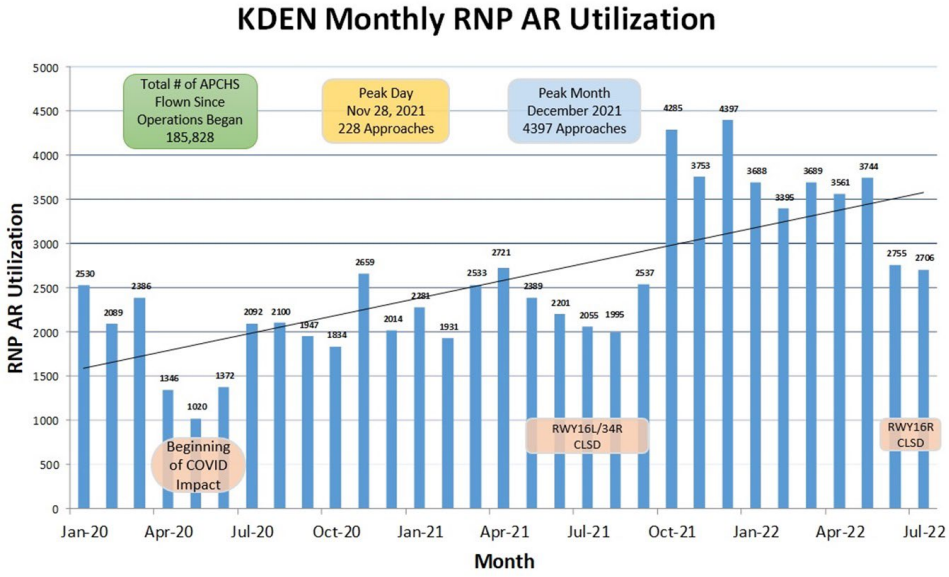
Cleared 6,298 flights

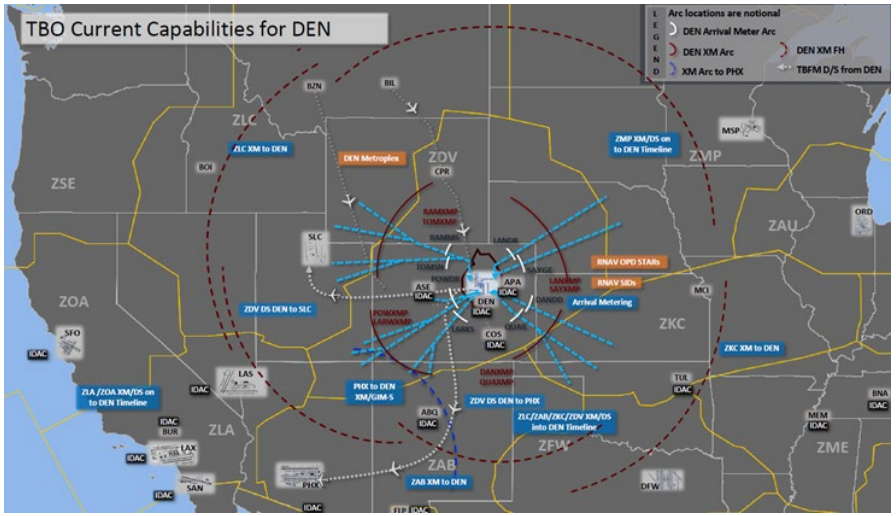
Saved 516 minutes of airspace user time (gate and taxi)

Prevented 18,224 kgs of CO_2 Emissions

Time-Based Flow Management (TBFM) - A prerequisite to TBO functioning daily at DEN

- More consistent use of metering in ZDV since Oct 2021 deployment.
- XM allows greater flexibility and is attributed to increased use of RNP approaches (from 2500/month to 3500/month)



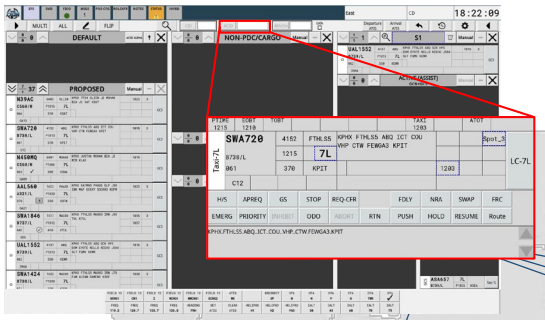


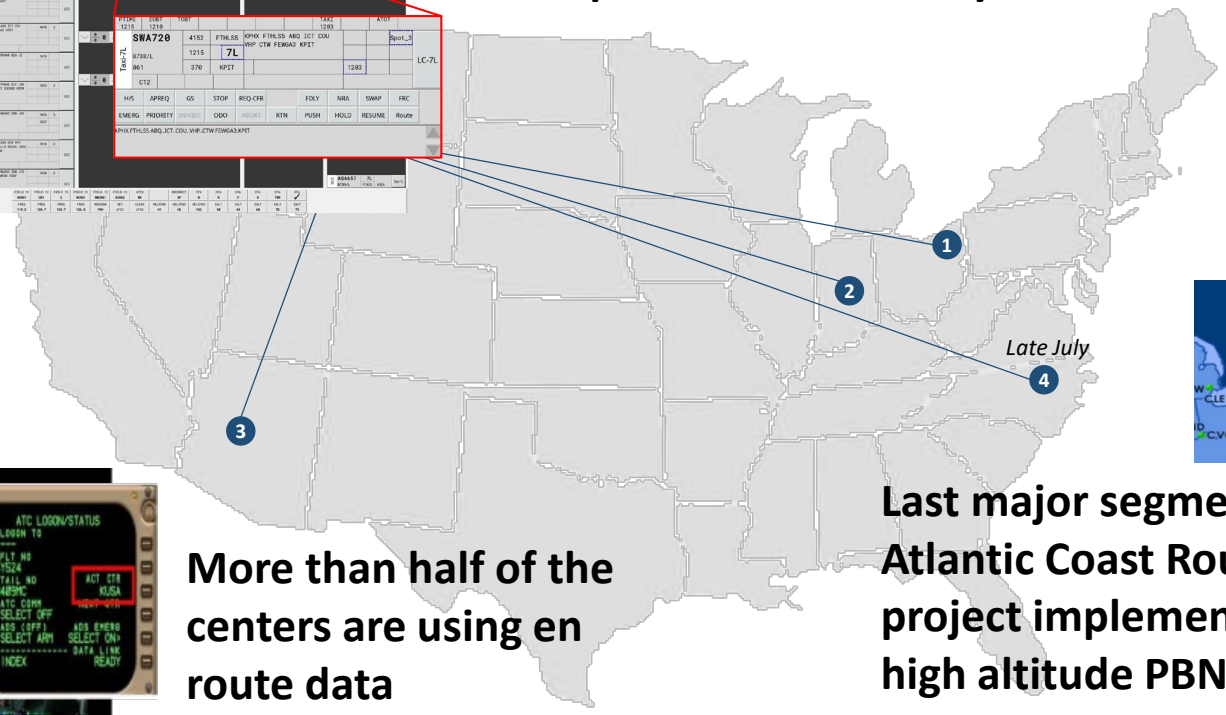
NAC Subcommittee Chair's Overview

Warren Christie, NAC SC Chair (JetBlue Airways)

Overview of Implementation Milestones (since February 2023 NAC)

Electronic Flight Strips (EFS) are operational at three airports, with a fourth planned for late July





More than half of the centers are using en route data communications

Last major segment of the Atlantic Coast Routes project implemented new high altitude PBN routes

Workgroup Presentations

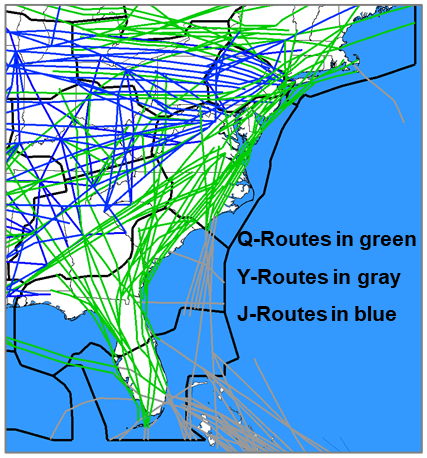
- **Northeast Corridor:**
  - Ralph Tamburro (PANYNJ) & Lee Brown (JetBlue Airways)
  - Aaron Wilkins (FAA), Juan Narvid (FAA), & Raul Zamora Jr. (FAA)

- **Performance Based Navigation:**
  - Eric Morse (Delta Air Lines)
  - Aaron Wilkins (FAA), Juan Narvid (FAA), & Raul Zamora Jr. (FAA)

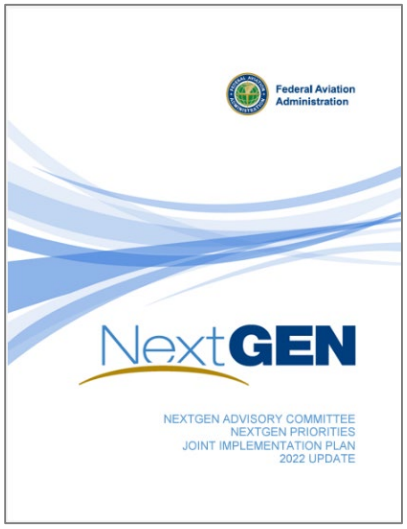
- **Surface and Data Sharing:**
  - Rob Goldman (Delta Air Lines) & Chris Oswald (ACI-NA)
  - Doug Swol (FAA) & Ayaz Kagzi (FAA)

- **Data Communications:**
  - Chris Collings (L3Harris) & Ed Evans (Southwest Airlines)
  - Kathy Torrence (FAA)

Northeast Corridor/Performance Based Navigation – Status



Actively using high-altitude routes implemented as part of the Atlantic Coast Routes (ACR) effort in late April



No changes to the remaining implementation commitments (since February NAC)

Airspace move in New York is currently on hold; impact to current commitments is unknown

All Industry commitments are complete or on schedule

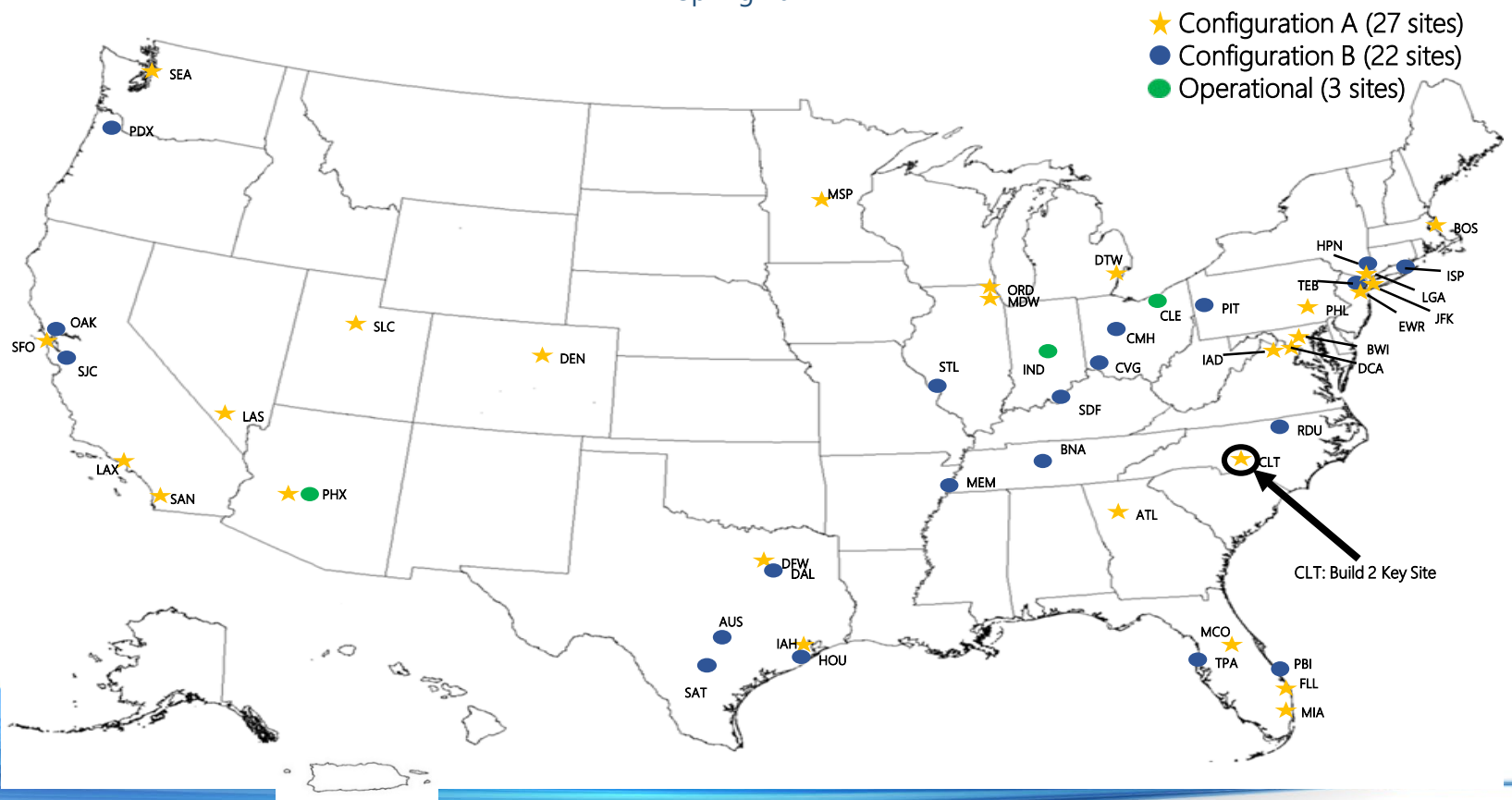
Surface & Data Sharing – NAC Update

Key TFDM Updates

- Indianapolis (IND) achieved IOC on Build 1 (Electronic Flight Data) on 5/15
  - First site to directly transfer from paper flight strips to electronic flight and TMI data
- Phoenix (PHX) achieved IOC on Build 1 on 6/5

Near Term Activities

- TFDM 4th IOC at Raleigh-Durham (week of July 24th)
  - Completes another NAC milestone
- Updated TFDM waterfall planned for release in late June based on FY25 budget guidance
- Las Vegas Collaborative Site Implementation Team (CSIT) week of June 12th
- TFDM Build 2 (Surface Management Tools) on track for IOC in Spring 2024



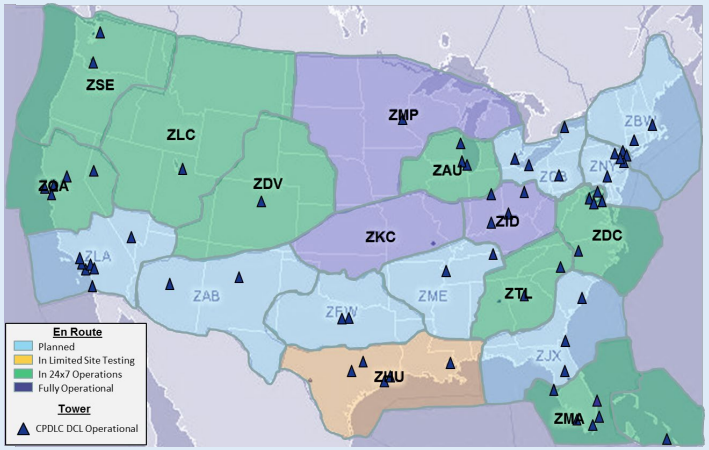
Surface NIWG – Plans for Summer/Fall 2023

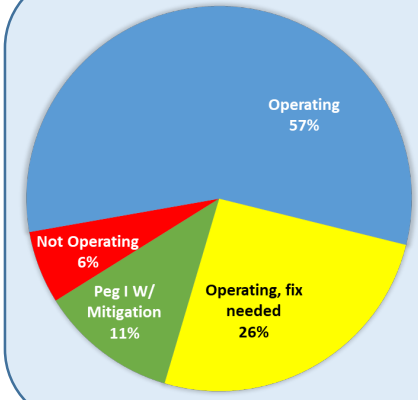
- Provide industry input and guidance regarding TFDM implementation
- Assist with Collaborative Site Implementation Team (CSIT) efforts when helpful.
- Seeking to engage members in discussion of how industry (flight operators, airport operators) can enhance surface operation safety and efficiency.
  - Technology
  - Process changes
  - Use of surface data
- Turn attention to what's next in collaborative flow management
  - surface management is an integrated component of flow management tools and processes
  - utilize data exchange to manage NAS capacity/demand
  - support efficiency, throughput and sustainability

Data Comm – NAC Update

En Route Data Comm Deployment

+ 11 centers operational 24/7
+ Houston Center began testing May 10
+ En Route Full Services Increment 1 active at all active centers
– En Route deployment delayed due to funding constraints

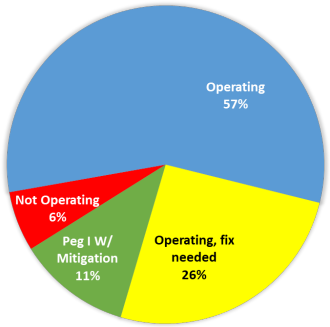




Industry & Avionics Performance Updates

+ Installation of avionics updates over halfway complete
+ Continue to receive positive user feedback as usage grows
– Awaiting Data Comm avionics updates blocking fleet participation with no confirmed plan (A220)
– NIWG members expressed concern about the “Enhanced Services” baseline slipping to end of 2029

Data Comm Avionics Updates Fleet Status



Aircraft operating in Data Comm En Route – No Pending Actions (57%)	
Alaska Airlines: B737	**JetBlue:** A321LR
American Airlines: B737, B777, B787	**Southwest Airlines:** B737
Delta: A330neo	**United:** B777, B787
FedEx: B777, MD11	**UPS:** B744, MD11, B748

Avionics Action	Operator/Fleet	Status
Aircraft operating in Data Comm En Route with Crew Procedure Mitigation (11%)		
Boeing 757/767 Pegasus 1	FedEx, UPS	Aircraft operating under procedure mitigation; Avionics Update: Peg 1 BP11 (Q3 2023)
Aircraft operating in Data Comm En Route with Open Avionics Actions (26%)		
Collins CMU 900 Core 16	American, Delta, United	Delta & United began installs; American nearing completion
Boeing 767 ATN 505+ (Core 16)	FedEx	Newly delivered B767s starting in mid-2022 do not have “Core 16” equivalent avionics. Update planned Q2 2023.
Boeing 747-8 ATN-203 (Core 16)	UPS	“Core 16” equivalent. Installs ongoing.
Airbus A320 ATSU CSB 7.5	Alaska (100%), American (100%), Delta (17%), JetBlue (99%)	CSB 7.5 released in late 2020, technical issues increased, root caused; Fix planned for CSB 7.6 Q4 2024 (or CSB 9 available now)
Airbus A320 ATSU CSB 7.6	Alaska, American, Delta, JetBlue	CSB 7.6 planned for Q4 2024 (or CSB 9 available now)
Aircraft removed from Data Comm En Route due to Open Avionics Actions (6%)		
Collins VDR Update	United	Install delayed
Boeing 757/767 Pegasus 1	United	Pending Peg 1 BP11: Q2 2023
Airbus A220	Delta, JetBlue	Pending avionics fixes, FMS update Q4 2023; **RIU update TBD**
Airbus A350	Delta	Pending avionics fix, installs to begin soon

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

NAC Task 23-1: NAS Airspace Efficiencies

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

Shawn Kozica (FAA)

NAC Task 23-1: NAS Airspace Efficiencies

The FAA requests NAC advice on ways to achieve greater airspace efficiencies as we collaboratively attempt to reduce reliance on and divest from legacy systems and procedures and move to a reliance on a more modernized NAS.

The FAA offers the following suggestions as a way to begin the efficiency discussions:

1. Within the scope of current FAA automation capabilities, explore opportunities for increased utilization of existing Performance Based Navigation (PBN) procedures.
2. Identify opportunities for industry to leverage efficiencies gained from their avionics and dispatch systems investments while simultaneously allowing the FAA to divest from legacy NAS elements that do not contribute to those efficiencies.
3. Identify opportunities for the FAA to remove existing and infrequently used Instrument Flight Procedures (IFPs).
4. Identify opportunities to potentially modify existing IFPs/Standard Instrument Departure Procedures (SIDs)/Standard Terminal Arrival Procedures (STARs) to gain overall airspace efficiencies.
5. Identify a recommended baseline PBN and non-PBN IFP infrastructure to provide the minimum service level and airport access for both non-Global Positioning System/Area Navigation equipped aircraft and aircraft with advanced avionics for each Navigation Services Group Airport Category (1-5).
6. Identify any trends in IFP/SID/STAR inventory suggestions that might be used as a national standard.
7. Explore opportunities for even greater efficiencies with the use of Advanced Required Navigation Performance (A-RNP) as is being pursued by the Performance Based Operations Aviation Rulemaking Committee.
8. Work with the NAC Subcommittee Minimum Capabilities List (MCL) Team to capitalize on any cross-cutting issues that might support both taskings and industry achieving MCL-level of equipage.

Value of this Tasking

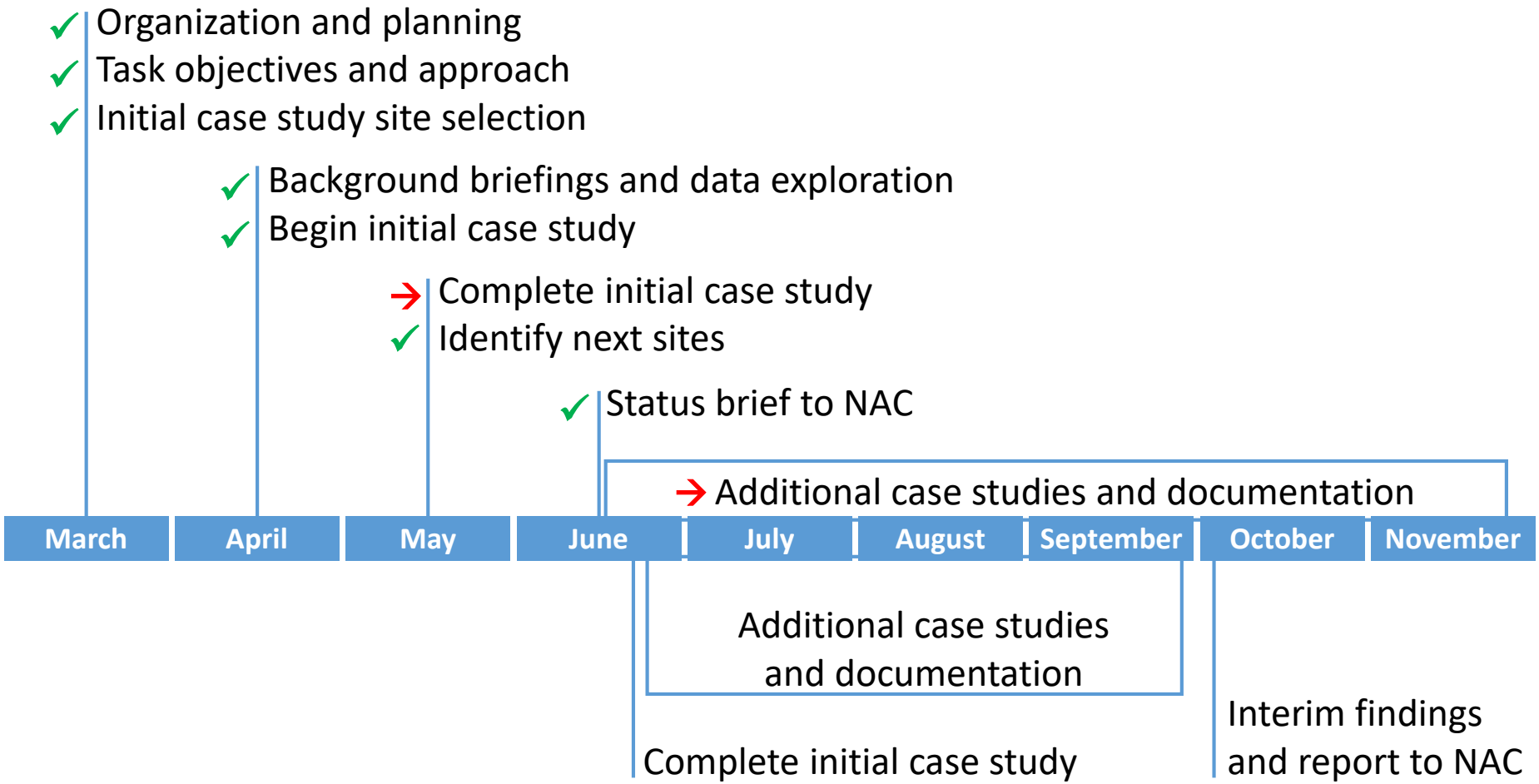
Presents the potential to inform…

- Long-term planning and priorities
- National standards that will help achieve the principals of the NAS Navigation Strategy
- How we do business going forward -where we invest and how we resource

Managing procedure inventory is important, but this tasking is not limited to that

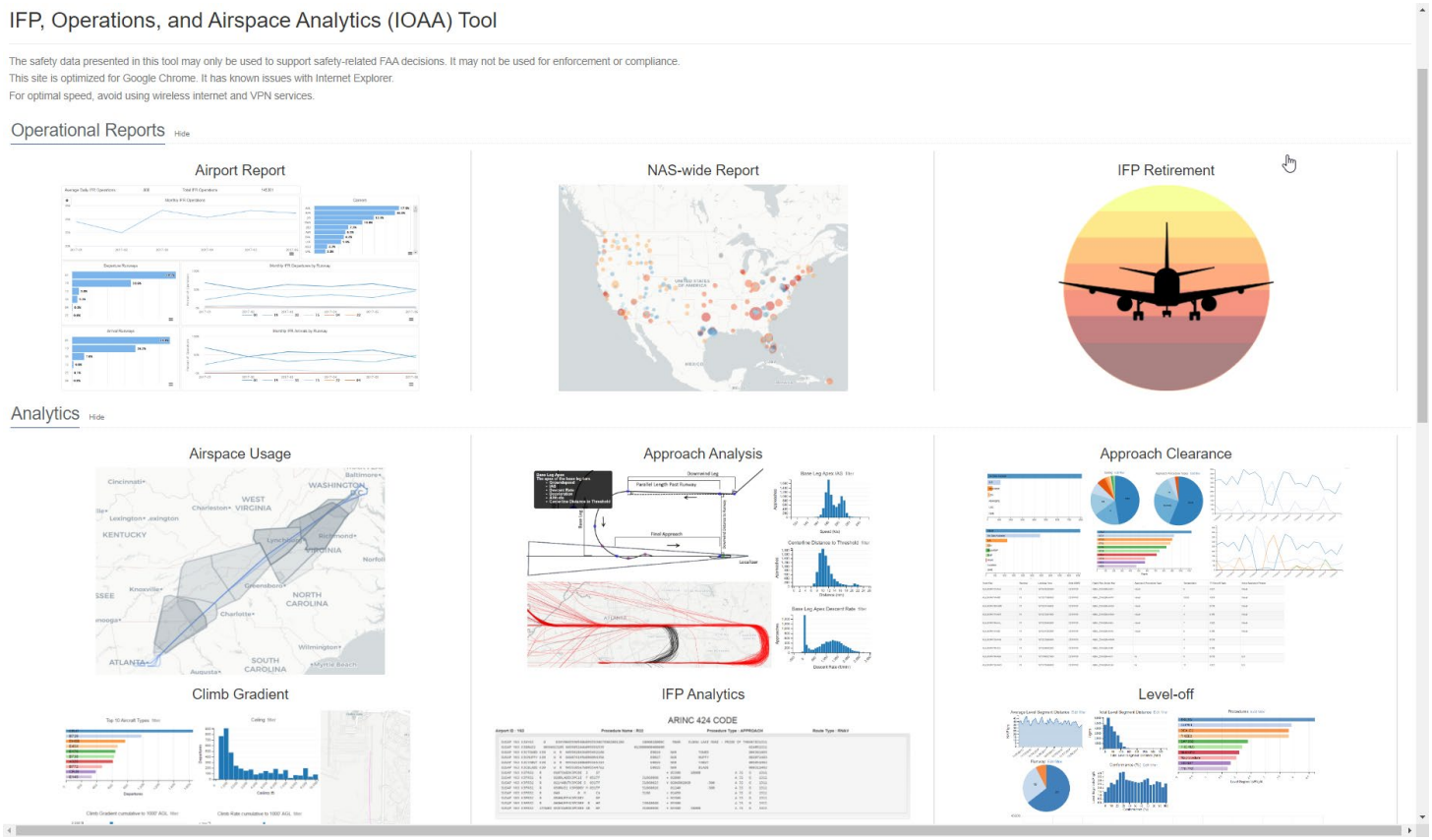
- There have been previous efforts to reduce the instrument flight procedure inventory which should support this task

Task Schedule and Progress Overview



Work Group Activities - Supporting Data

Use of IFP Operations, and Airspace Analytics (IOAA) Tool for database driven decisions



Working Group Activities – Data Driven Process

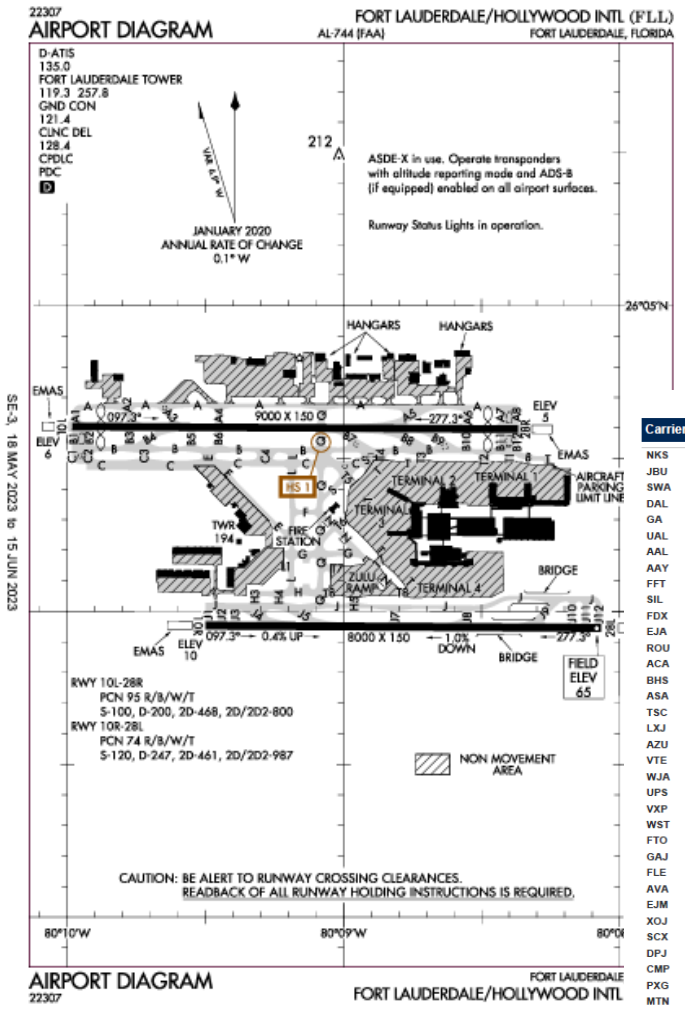
- **Since the last NAC, the group has started to define a process that can look at both objective and subjective facts**

- **Process includes:**
  - Notional minimum service levels based on airport NSG category
  - Comprehensive list of other considerations that need to be given if IFPs are to be removed

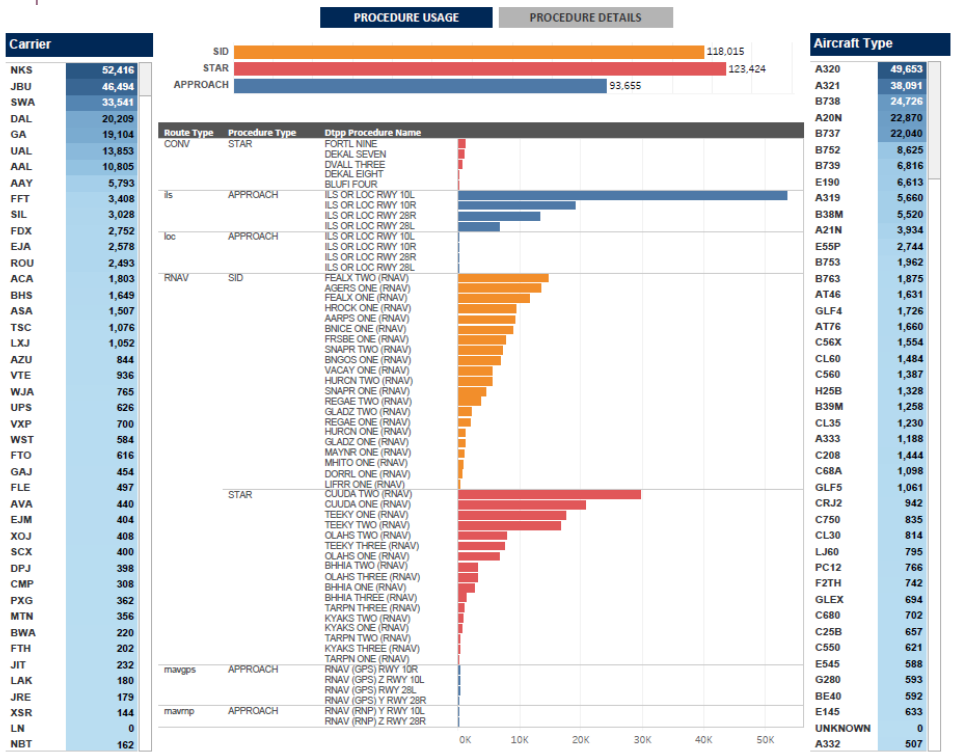
Process Worksheet Overview

Airspace Constraints	Airport Planned Changes (New runways, Construction, Closed areas)
Runway Configuration/Airport Layout	Types of Operations (flight training/air ambulance/etc.)
Common Weather Patterns (Foggy, low vis, etc.)	Operation Peaking/Limitations Due to Throughput
Airport Lighting Consideration	Military Presence (type of operations, fleet mix, etc)
Terrain Contraints/Obstacle Constraints	Procedure Constraints (arrival to approach connections)
Noise Constraints/Airfield/Flight Procedure Environmental Review Currently Underway	Special Events held at/near airport
Operational Trial Activities/Potential Activities	Contingency Procedures (ATC assigned only)
Controller Tools Available	User Requested Approaches
Fleet Mix (aircraft types/fixed wing/ helo/etc.)	ATC Resources
Operator Mix	Redundant Procedures (direction/equipage/etc.)
Equipage Levels	Procedures that are designed but don't work in the airspace

Initial Case Study – Fort Lauderdale



- Fort Lauderdale selected as first site for case study
- FAA provided data on fleet mix, procedure usage, etc.
- Initial review of procedures completed



Next Steps

- **Additional case studies that will tease out additional items from the tasking**

	DEN	LAX	DFW, DAL, ADW	LGA, JFK, EWR, TEB, HPN	BNA
NSG 1?	X		X	X	
Lots of procedures?	X	X	X		
Redundant procedures?	X		X	X	
Limited PBN?				X	
Under- or well-utilized?	X	X			X
More than one airport?			X	X	

- **Scoping work over the summer**
  - May include working case studies in parallel
- **Targeting initial findings for report to NAC in October**
  - Include conclusions from completed case studies
  - Identify additional deliberations to address full scope of the tasking

FAA Topics

Katie Thomson, Delegated NAC Designated Federal Officer (FAA)

Section 547 Update

Juan Narvid (FAA) & Kathy Torrence (FAA)

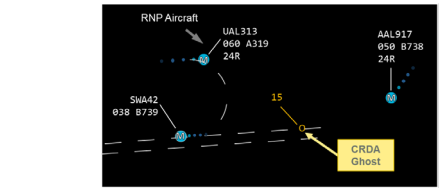
Section 547 Pilot Program:
Preliminary Analysis Results

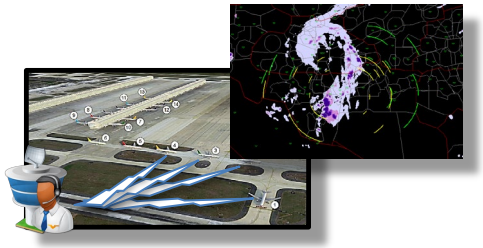
June 2023

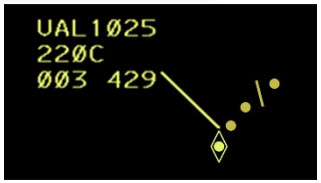
Overview of Selected Section 547 Initiatives

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)*





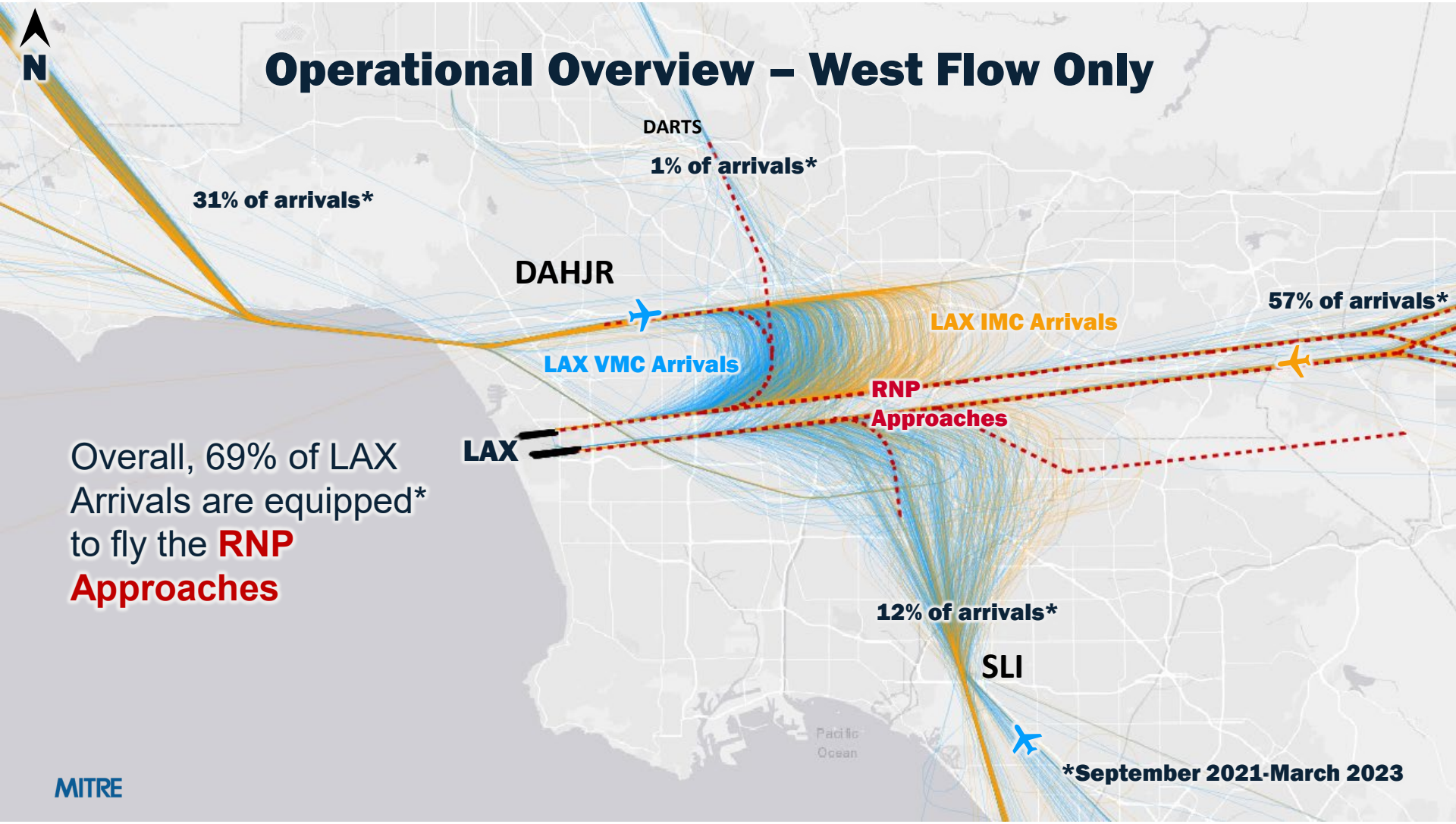


PBN RNP Equipage= Reduced Flight Distance and Flight Time

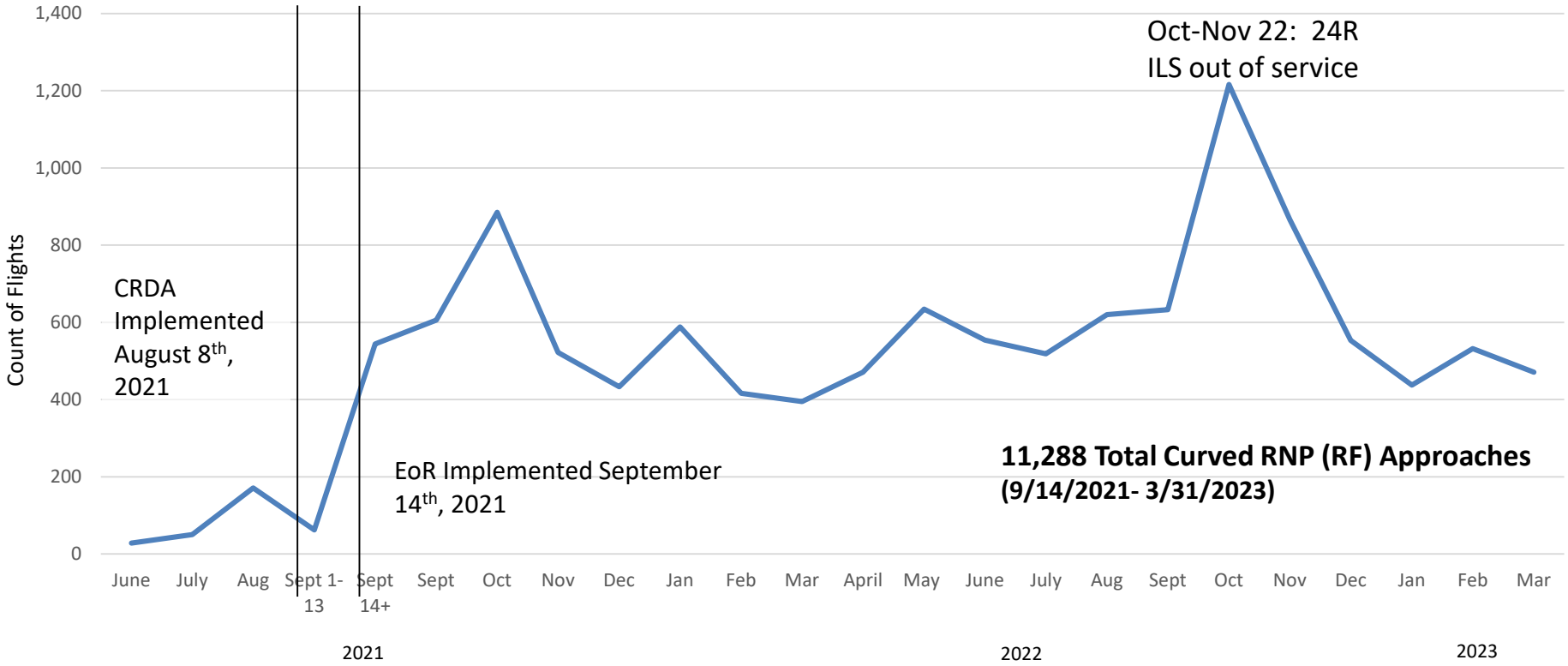
Data Communication Equipage= Earlier Departure During Rerouting Events, and overall system efficiency

ADS-B Out Equipage= Reduced spacing/distance flown

LAX: ESTABLISHED ON RNP (EOR) INITIATIVE


N
Operational Overview – West Flow Only
DARTS
1% of arrivals*
31% of arrivals*
DAHJR
57% of arrivals*
LAX IMC Arrivals
LAX VMC Arrivals
RNP
Approaches
LAX
Overall, 69% of LAX Arrivals are equipped* to fly the RNP Approaches
12% of arrivals*
SLI
Pacific Ocean
*September 2021-March 2023
MITRE

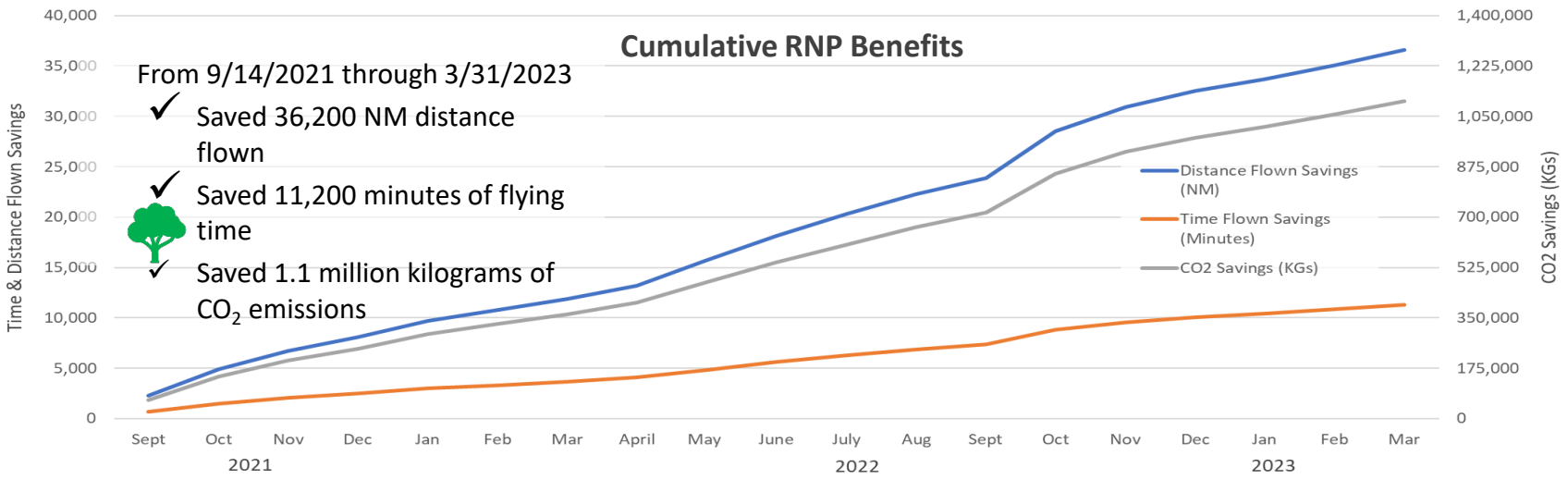
Monthly Curved RNP (RF) Usage – West Configuration Only



RNP RF Benefits – West Flow

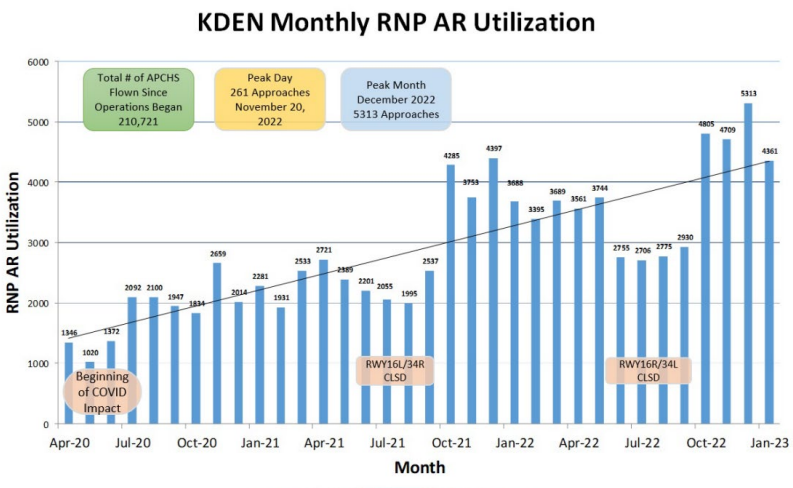
Flight Efficiency Improvements for RNP RF vs Non-RNP Approach Operations

	Savings per Flight			
VMC/IMC	**Distance Flown (NM)**	**Time Flown (Minutes)**	**Fuel Burn (Gallons)**	**CO_2 Emissions (kgs)***
VMC	**2.5**	**0.8**	**9.1**	**81.0**
IMC	**6.6**	**2.1**	**20.2**	**174.5**

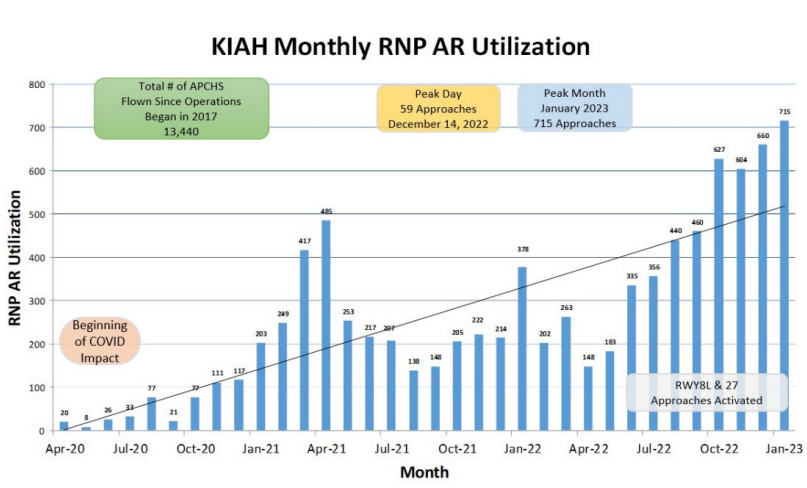


Other Locations Using Curved RNP Approaches

DEN Count – January 2023



IAH Count – January 2023



ZOA: ADS-B OUT, 5NM TO 3NM REDUCED SEPARATION INITIATIVE

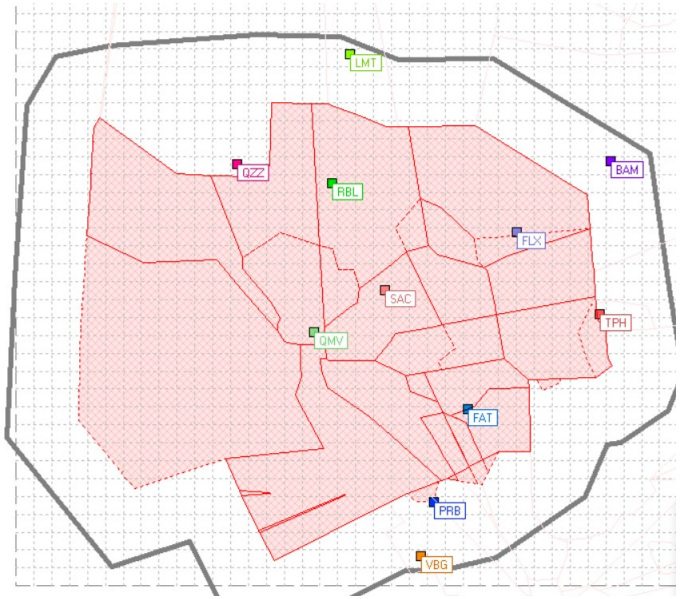
Reduced Separation from 5NM to 3NM using ADS-B Out Equipage

Adapted for 3NM Separation (FL230 and below)

12/31/2020

Adapted for 3NM Separation (FL230 and below)

10/12/2021

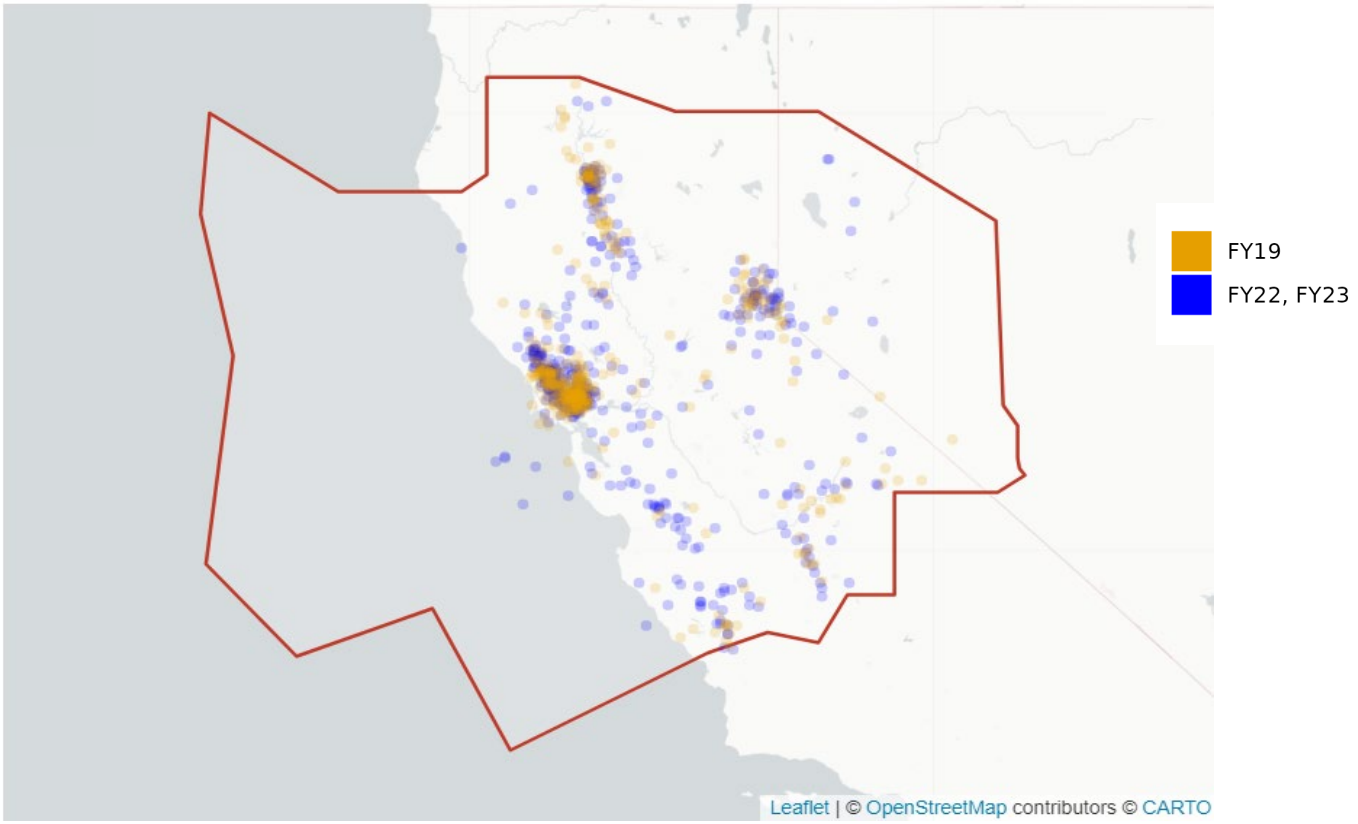


Automation changes enabled more consistent use of 3NM separation at low altitudes within ZOA.

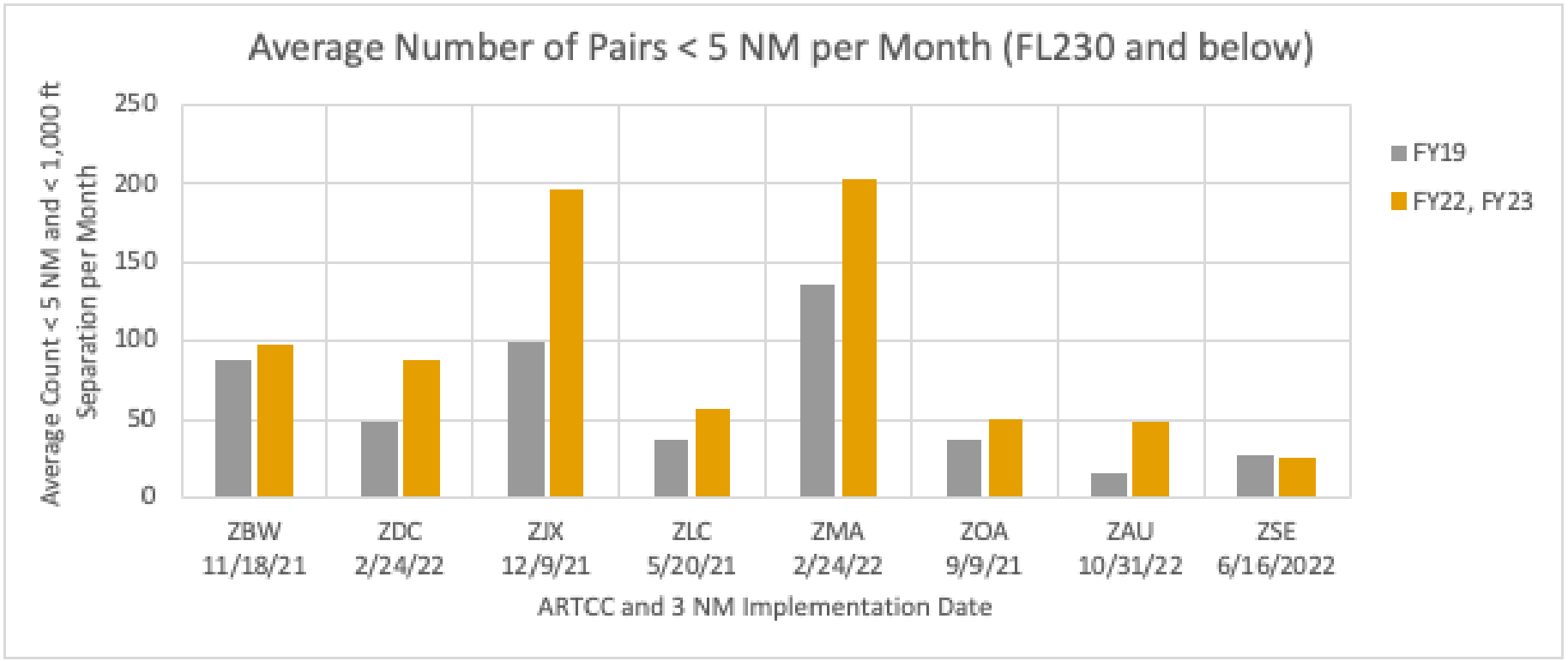
62

ZOA Opportunities to Use 3NM Separation Standard

Blue areas represent an increase in opportunities to reduce separation from 5NM to 3NM

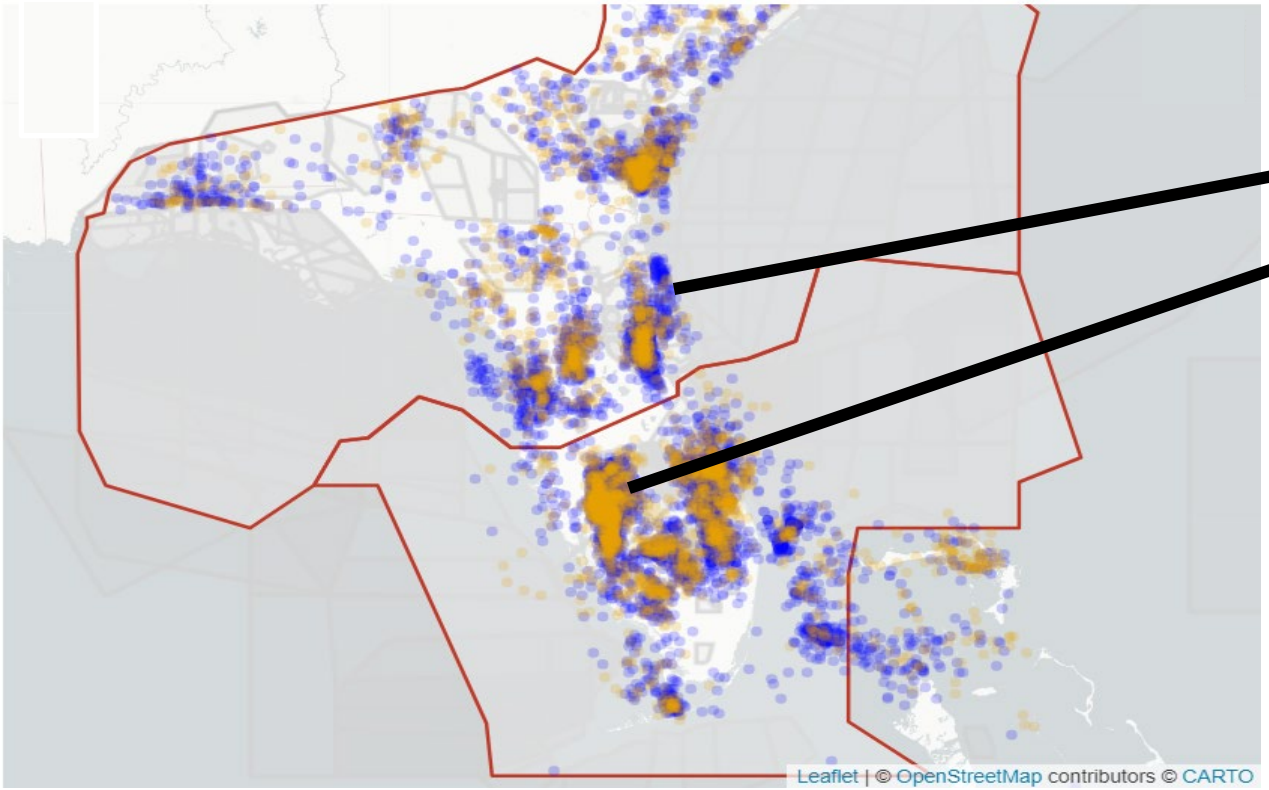


All ARTCCs with 3NM Separation Implemented



Note: Includes some VFR aircraft

ZMA & ZJX Pre-Implementation v. Post-Implementation

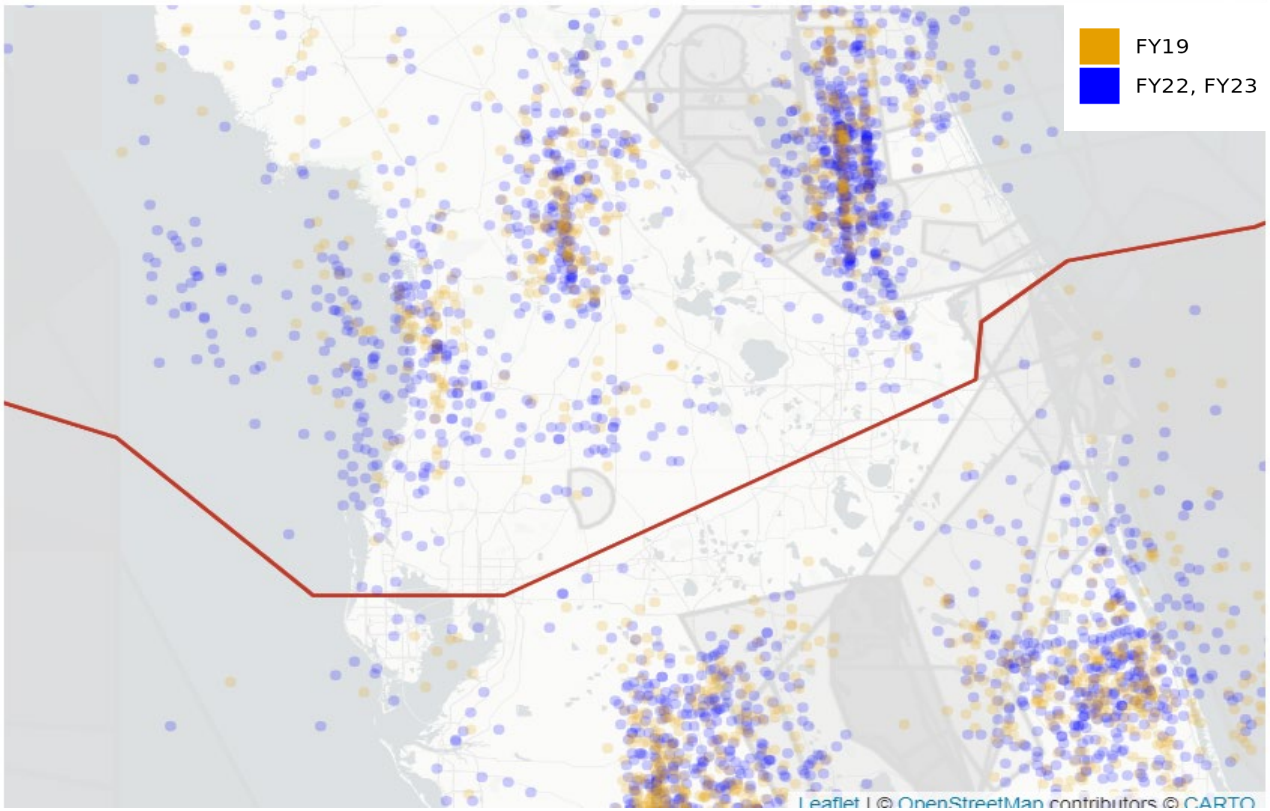


Opportunities increased where capacity of airspace constrains flow and lateral separation is used more frequently

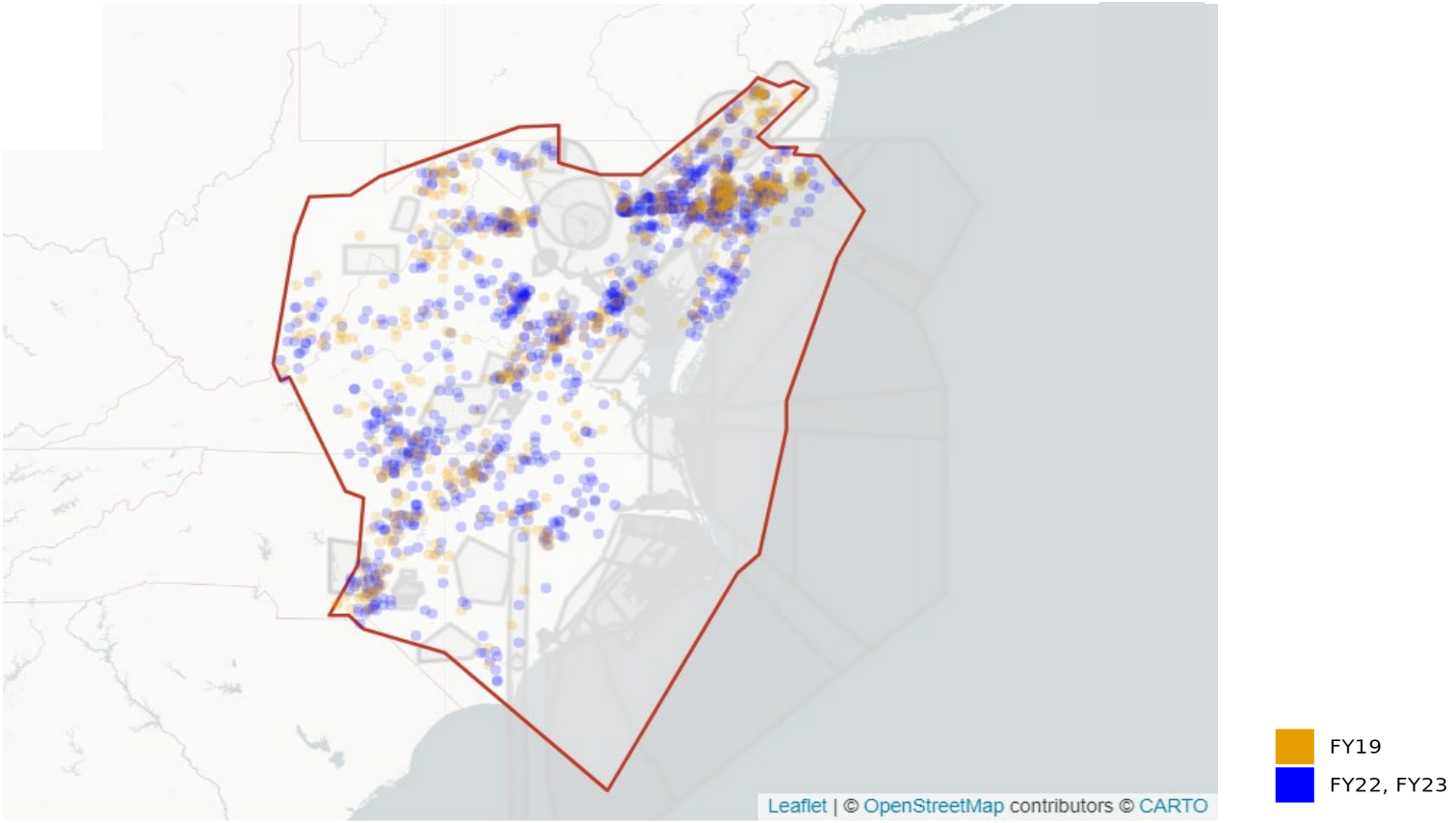
FY19
FY22, FY23

ZMA and ZJX Zoom

Opportunities increased close to center boundary because of uniform separation standard



ZDC Pre-Implementation v. Post-Implementation



MCO: CPDLC DEPARTURE CLEARANCE INITIATIVE

Section 547 Data Comm: Orlando Metrics

April 2023

L3HARRIS

Federal Aviation Administration

Initiative Description

CPDLC Departure Clearance (DCL) **capabilities at Orlando International Airport** (MCO)

- **Overview**

  Use of DCL can provide CPDLC equipped operators revised departure clearances in a more time-efficient manner compared to unequipped operators. This is especially beneficial when reroutes are necessary due to weather or other air traffic disruptions.

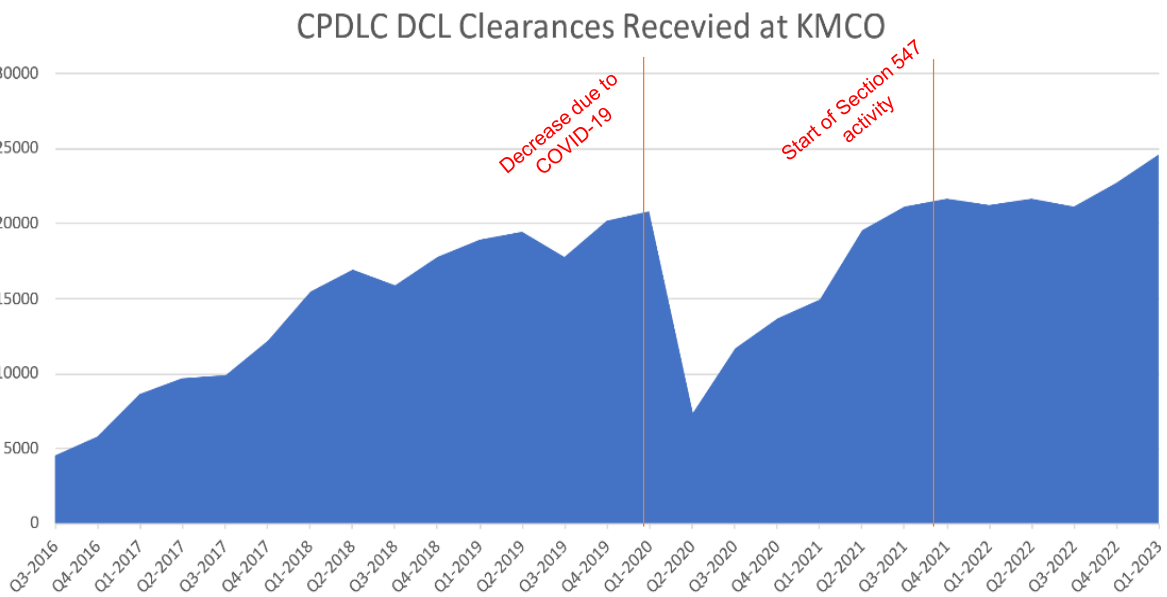
- **Anticipated Benefits**

  Minutes of Airspace User Time Saved and kilograms of CO_2 Emissions Prevented

- **Start Date**

  Focused data collection and metric tracking beginning 9/1/2021

Orlando CPDLC DCL Departures

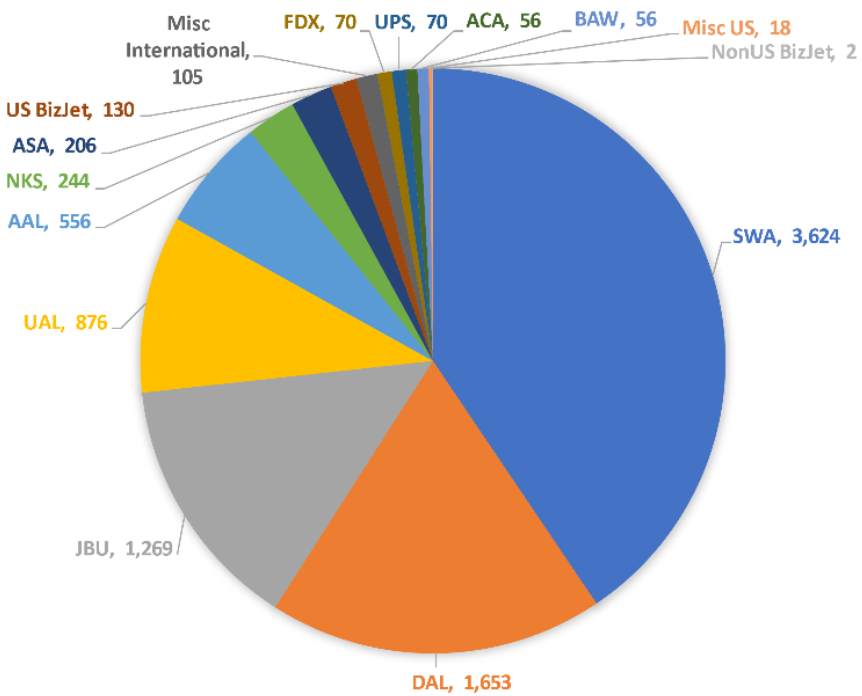


AIR CANADA
Alaska
American Airlines
AMERIJET INTERNATIONAL AIRLINES
Aer Lingus
BRITISH AIRWAYS
DELTA
Emirates
FedEx
HAWAIIAN AIRLINES
jetBlue
KALITTA AIR
LATAM AIRLINES
Lufthansa
NATIONAL
Southwest
spirit
TAM
UNITED
ups

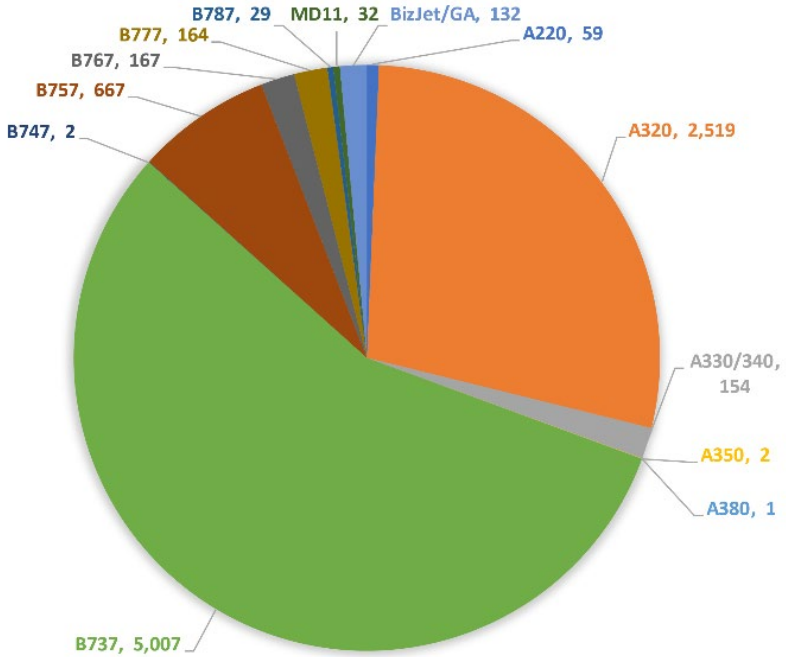
Orlando CPDLC DCL Clearances

April 2023

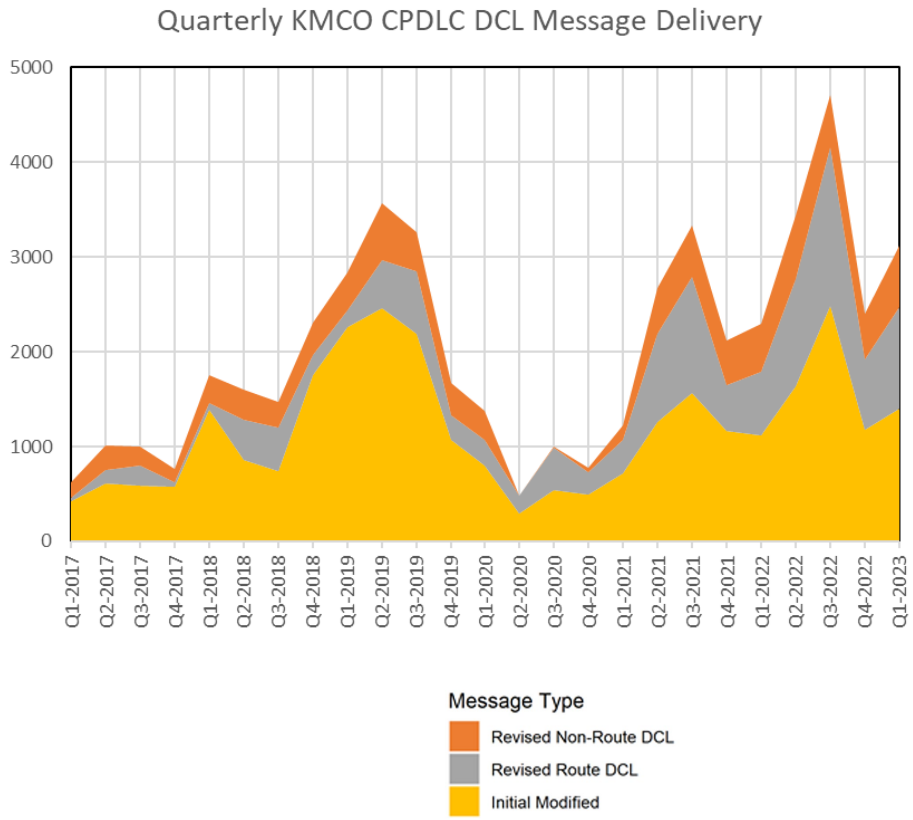
By Operator



By Aircraft Type



Orlando CPDLC DCL Messages Delivered



Cleared as Filed	The participating flight receives no changes/modifications to their original/intended route of flight filed in their flight plan.
Initial Modified	The participating flight receives a change to their original/intended route of flight on the filed flight plan, this change could be a route or non-route change.
Revised Route DCL	The participating flight receives a change/modification to their original/intended route of flight on the filed flight plan that resulted in a route change from air traffic control.
Revised Non-Route DCL	The participating flight receives a change to their original/intended route of flight on the filed flight plan. This change/modification only affected non-route information such as, but not limited to, squawk code or departure frequency.

Orlando CPDLC DCL Benefits

Since January 2021

Cleared 170,338 flights

Saved 35,193 minutes of airspace user time (gate and taxi)

Prevented 959,145 kgs of CO_2 Emissions

In February 2023

Cleared 7,516 flights

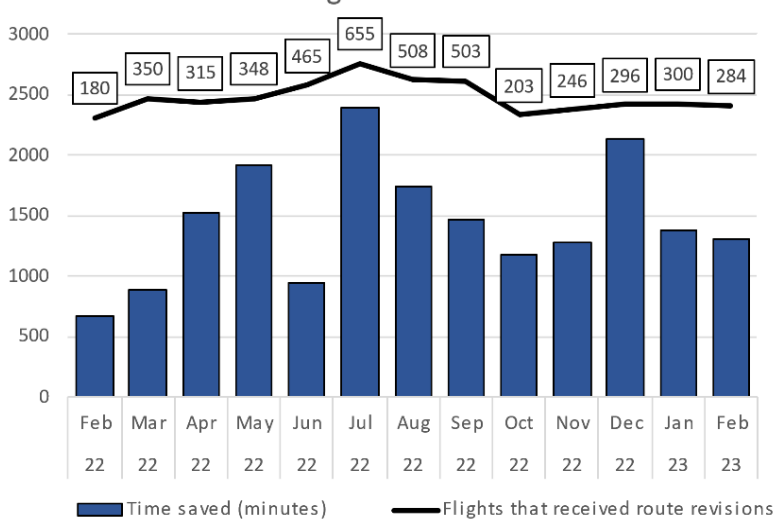
Saved 1,307 minutes of airspace user time (gate and taxi)

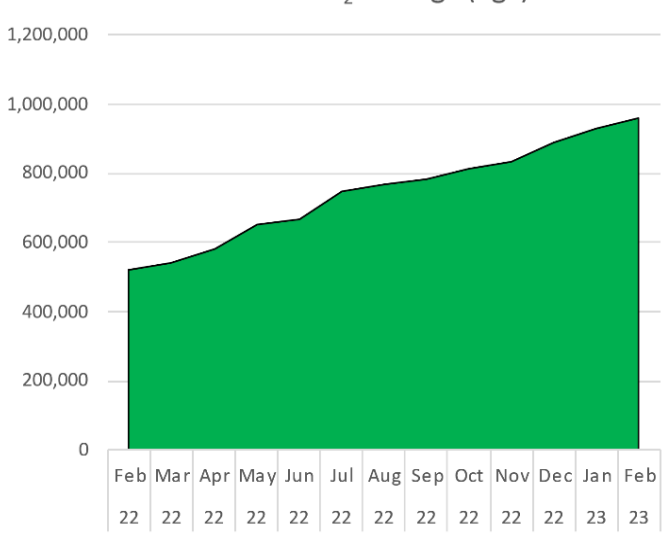
Prevented 28,929 kgs of CO_2 Emissions

**Benefits are derived using ASPM data which is verified 3 months after the month closes.*

Orlando CPDLC DCL Benefits Trend

Time Savings and Emission Reductions





**Benefits are derived using ASPM data which is verified 3 months after the month closes.*

DFO Comments

Katie Thomson, Delegated NAC Designated Federal Officer (FAA)

Review of Action Items & Other Business

Kimberly Noonan, NAC Committee Manager (FAA)

Upcoming Meetings

- **NAC**
  - October 4, 2023 (1:00pm - 4:00pm ET) - Hybrid

Closing Comments & Adjourn

Chip Childs, NAC Chair

President & CEO (SkyWest Airlines)

NextGen Advisory Committee (NAC)
June 12, 2023 Attendance List

Last Name	First Name	Affiliation
Adcock	Tom	National Air Traffic Controllers Association
Aguirre	Carlos	Professional Aviation Safety Specialist
Ambrosi	Jason	Air Line Pilot Association
Andrews	Malcolm	Federal Aviation Administration
Arel	Tim	Federal Aviation Administration
Armstrong	Merrill	Federal Aviation Administration
Assink	Elizabeth	Federal Aviation Administration
Baker	Mark	Aircraft Owners and Pilots Association
Baker	Jodi	Federal Aviation Administration
Batchelor	David	SESAR JU
Beck	Robert	Federal Aviation Administration
Bolen	Ed	National Business Aviation Association
Breitenfeldt	Rick	Federal Aviation Administration
Brez	Jason	Federal Aviation Administration
Brown	Lee	JetBlue Airways
Bruckbauer	Brian	Air Traffic Control Association
Buckley	Kerry	MITRE Corporation
Bunce	Pete	General Aviation Manufacturers Association
Carter	Taiya	Federal Aviation Administration
Cebula	Andrew	Airlines for America
Challan	Peter	L3Harris Technologies
Childs	Russell	SkyWest Airlines

Last Name	First Name	Affiliation
Christiansen	Cindy	Aviation-Impacted Communities Alliance (AICA)
Christie	Warren	JetBlue Airways
Collings	Chris	L3Harris Technologies
Cook	Charles	JetBlue Airways
Crandall	Kathy	L3Harris Technologies
Dalton	Rick	Southwest Airlines
Dehart	Scott	Southwest Airlines
DiMento	Patrick	FedEx Express
Dodgen	Joey	Delta Air Lines
Donnelly	Kurt	Professional Aviation Safety Specialist
Donohue	Denis	Raytheon Technologies
Dudley	Trent	U.S. Air Force
Dudley	John	American Airlines
Duffy	Kent	Federal Aviation Administration
Durkins	Natasha	Federal Aviation Administration
Eck	Jim	L3Harris Technologies
Evans	Edward	Southwest Airlines
Flores	Ignacio	Federal Aviation Administration
Flynn	Robert	United Airlines
Fontaine	Paul	Federal Aviation Administration
Green	June	Federal Aviation Administration
Gullan	Nina	Federal Aviation Administration
Gupta	Vipul	Honeywell Aerospace
Gusky	Amy	Federal Aviation Administration
Guthrie	Roddy	American Airlines
Guy	Rebecca	Federal Aviation Administration

Last Name	First Name	Affiliation
Hamilton	Dan	National Air Traffic Controllers Association
Heilweil	Rebecca	FedScoop
Heins	Joe	United Airlines
Hennig	Jens	General Aviation Manufacturers Association
Hood-Fleming	Alyce	Federal Aviation Administration
Hope	Chris	Federal Aviation Administration
Hunt	Rob	Federal Aviation Administration
Ivers	Ben	The Boeing Company
Iversen	Jennifer	Regional Airline Association
Johnson	Antionette	Federal Aviation Administration
Joly	Pascal	Airbus
Kagzi	Ayaz	Federal Aviation Administration
Kamyab	Ahmad	Federal Aviation Administration
Kandel	Jennifer	Federal Aviation Administration
Kasher	Alan	Southwest Airlines
Kehrer	Alison	United Airlines
Keller	William	ATAC Corporation
King	Dennis	U.S. Air Force
Kirk	Chad	AIA Aerospace
Knorr	Dave	Federal Aviation Administration
Kolb	Gary	Federal Aviation Administration
Kovalcik	Luanne	Leidos
Kozica	Shawn	Federal Aviation Administration
Landon	Joseph	Crescent Space / Lockheed Martin
Loring	Christopher	Federal Aviation Administration
Lott	Angela	Federal Aviation Administration

Last Name	First Name	Affiliation
Lozano	Jana	Delta Air Lines
Maffei	John	Federal Aviation Administration
Mathur	Rajat	U.S. Senate Government
McClay	Jim	Aircraft Owners and Pilots Association
McDowell	Michael	Collins Aerospace
McGraw	Candace	Cincinnati / Northern Kentucky International Airport
McLean	Donna	Donna McLean Associates, LLC
McLean	Andrew	Southwest Airlines
Mets	Dave	Alaska Airlines
Mlitello	Tony	U.S. Air Force
Morse	Eric	Delta Air Lines
Morse	Glenn	Opt Online
Mueller	Andy	Federal Aviation Administration
Narvid	Juan	Federal Aviation Administration
Noonan	Kimberly	Federal Aviation Administration
O'Connor	Wendy	Federal Aviation Administration
O'Kelly	Caitlin	Federal Aviation Administration
Pagliarello	Melinda	Airports Council International - North America
Pearce	Robert	NASA
Pennington	Darrell	Air Line Pilot Association
Perez Molina	Karina	AIA Aerospace
Peyton	Bret	Alaska Airlines
Pierce	Brad	NOISE
Post	Joseph	University of South Florida
Quinn	Cheryl	NASA
Rehaluk	Jeffrey	Airlines for America

Last Name	First Name	Affiliation
Rubio	Greg	Primacy Strategy Group
Ryle	Gary	Federal Aviation Administration
Santa	Richard	National Air Traffic Controllers Association
Santos	Phil	FedEx Express
Schwab	Greg	Federal Aviation Administration
Silverman	Eric	American Airlines
Smith	Ryan	United Airlines
Smith	Elly	MITRE Corporation
Snow	Marissa	SkyWest Airlines
Spero	Dave	Professional Aviation Safety Specialist
Spurio	Kip	Raytheon Technologies
Stevenson	Dawn	Federal Aviation Administration
Subramanian	Prakash	MITRE Corporation
Sultan	Akbar	NASA
Swol	Doug	Federal Aviation Administration
Sypniewski	Jessica	Federal Aviation Administration
Tamburro	Ralph	Port Authority of New York and New Jersey
Thomson	Katie	Federal Aviation Administration
Torrence	Kathy	Federal Aviation Administration
Townsend	Brian	Allied Pilots
Tranter	Emily	Primacy Strategy Group
Trottenberg	Polly	Federal Aviation Administration
Turner	Lawrence	Southwest Airlines
Tyler	Jessica	American Airlines
Walters	Terry	Alaska Airlines
Washington	Keith	Federal Aviation Administration

Last Name	First Name	Affiliation
Wilkins	Aaron	Federal Aviation Administration
Willey	Douglas	Air Line Pilot Association
Williams	Ammyanna	Federal Aviation Administration
Williams	Heidi	National Business Aviation Association
Wongsangpaiboon	Natee	Federal Aviation Administration
Yaplee	Darlene	Aviation-Impacted Communities Alliance (AICA)
Yarnell	Susan	Federal Aviation Administration
Yates	Vaughn	Federal Aviation Administration
Yates	Kyndra	Federal Aviation Administration
Zamora	Raul	Federal Aviation Administration

June 12, 2023
NextGen Advisory Committee (NAC)

Public Speaker Comments

1. Cindy Christiansen, Aviation-Impacted Communities Alliance
2. Darlene Yaplee, Aviation-Impacted Communities Alliance

Comment to NextGen Advisory Committee (NAC)

Monday, June 5, 2023

For the public speak agenda item for the NAC meeting on **June 12, 2023**

NextGen's Performance Based navigation resulted in overflight communities across the country that now suffer from excessive aviation noise events because of GPS-navigated flight corridors. The number of noise events is so excessive that the FAA is considering changes to its noise policy to address the negative consequence of NextGen for "overflight communities" - areas "away from airports" where aviation events are not as loud as "close to the airport" but often are as many.

During the May 18, 2021 House Transportation & Infrastructure Subcommittee Roundtable on the "Final Approach: An Update on ATC Modernization", Paul Renaldi, President of the National Air Traffic Controllers Association, made a statement that the sacrificial overflight communities understand and live daily. He said:

> We hit the same position at the same altitude every time. …. There's a lot of winners in the noise game. They don't say anything because they don't hear any airplane noise. But the losers hear a lot of airplane noise.

So how can the FAA and this Committee remedy the problem it created for the losers? One way is to disperse flight paths across a "family of RNAVs" as Dr. Tom G. Reynolds of the Air Traffic Control Systems Group at MIT Lincoln Laboratory described in a January 13, 2016 email. However, we have learned that the Flight Management Systems (FMS) of most aircraft in use today lack the memory to allow two, let alone 4 or 5, arrival and departure paths for the purpose of dispersion by RNAV families.

How did it happen that NextGen, with its purpose to **modernize** the national airspace, ignored the need for upgraded memory in the FMS?

We encourage the FAA to ask the NAC to form a working-group committee that will report back to the full committee within 6 months with information that identifies capability and requirements to implement RNAV families including the 5 items in my written comment.

Thank you.

VERBAL COMMENT ENDS HERE.

1. Percent of aircraft by airline with a FMS capable of handling 4 or more approach and departure PBN flight paths for the aircraft's departure and arrival airports.

2. Barriers to developing and using RNAV-families to return flight path disbursement over communities and neighborhoods currently sacrificed by Performance Based Navigation's single concentrated flight paths;

3. The minimum distance from runway ends that dispersion can occur after departure and on approach;

4. Potential uses of Equivalent Lateral Spacing Operations (ELSO) for dispersion of departures, not for increased capacity;

5. Role of Ground Based Augmentation System (GBAS) for developing and using a Family of RNAVs for flight path dispersion over heavily impacted communities; and other topics, possibilities, and questions that occur during the engagement process.

Details

On January 13, 2016, when discussing procedures to disperse aircraft, Dr. Tom G. Reynolds of the Air Traffic Control Systems Group at MIT Lincoln Laboratory described a Family of RNAVs to disperse aircraft:

> There has long been the idea of a hybrid "multi-RNAV procedure" solution where the current RNAV procedure defines the center-line track of a family of RNAVs, with other family members offset by 1 and 2 nmi left and right of the center-line which ultimately all converge at about a 5 nmi final for arrivals, or diverge to these families a few miles after departure. When the airport is operating in a given configuration for long periods, each individual track could be used for an hour at a time to spread the noise within a swath similar to what would naturally result from vectored arrivals, but still enabling benefits of optimized RNAV procedures to be achieved.

Cindy L. Christiansen, PhD
Aviation-Impacted Communities Alliance

Comment to NextGen Advisory Committee (NAC)

For the public speak agenda item - NAC meeting on **June 12, 2023**

AICA
AVIATION-IMPACTED COMMUNITIES ALLIANCE

FAA Kevin Walsh's testimony to the House Committee on Transportation, March 17, 2022, "The FAA's core mission…[is to provide the safest and most efficient aerospace system in the world. This mission also] includes addressing the environmental impacts of [aviation, such as climate change, local air quality, and] noise."

The FAA would fail to fulfill its regulatory responsibilities, if for highly impacted 100-hot spot areas, FAA's new noise policy is not applied retroactively or FAA does not take actions to reduce noise impacts for these communities. We should look forward, not backward. NextGen overflight noise is not a past issue, it is a current issue.

We support the Federal Register comment from Nicholas Miller, FAA-2023-0855-0150 "I suggest in addition to policy revisions, the FAA needs to provide these citizens with the hopes that some sincere efforts will be made to improve their lives. FAA should not become another government agency in which no one has any confidence that it is capable of responding to their needs or that it is attempting to make their lives better" and "FAA should understand that it is currently behind the eight-ball, having pretty much reduced or eliminated any benefits provided to airport communities by the Part 150 process and the home sound insulation actions. [As you know, these programs made a difference in some restructures of airspace use to reduce aircraft community noise levels and by providing sound insulation for so many homes.] Then, FAA changed airspace use, moved dispersed operations to single tracks, basically giving communities a double whammy of not only eliminating the benefits of months (and years) of effort, but increasing many areas of noise exposure. These two results are certainly likely to produce extreme dissatisfaction."

And his statement "FAA should seriously consider what they can do to increase citizen confidence in the agency. And 'outreach' is not the answer, unless part of that effort is to discuss how FAA will attempt to improve their lives."

We urge you to support either applying the future noise policy retroactively for highly impacted areas or take actions to improve the lives of those highly impacted.

Respectfully submitted,

Darlene Yaplee
President and Co-founder
Aviation-Impacted Communities Alliance