

NextGen Advisory Committee (NAC) March 28, 2022 Meeting Summary

The NextGen Advisory Committee (NAC) convened in a hybrid format March 28, 2022. 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 and Written Statements

Opening of Meeting

NAC Chairman, Mr. Chip Childs (SkyWest, Inc.), opened the meeting and welcomed virtual attendees.

Public Statements

After reading the public meeting announcement and providing administrative housekeeping notes, Ms. Kimberly Noonan (FAA) invited pre-approved public speakers to make their respective pre-approved public statements. Before handing off to the speakers, she explained that given the number of registrants requesting to make statements was greater than could be reasonably accommodated at the meeting, the NAC Chairman limited the number of speakers to three. In accordance with the Federal Register Notice specifications, the NAC Committee Management Team performed a randomized lottery to determine the speakers. Registrants not selected were offered the opportunity to submit their comments as written statements. Two requestors submitted written statements in lieu of speaking that will become part of the permanent public record. Reference Attachment 3 for the full text of the following public statements, in addition to the written statements submitted.

- Ms. Darlene Yaplee Aviation-Impacted Communities Alliance (AICA) and Concerned Citizens of Palo Alto
- Ms. Jennifer Landesmann (no affiliation provided)
- Mr. Mark Shull Palo Alto, CA

Chairman's Report

Mr. Child's began by saying he is absolutely thrilled to be joining the meeting in person from Washington, D.C., along with NAC Member and NAC Subcommittee Chairman, Mr. John Ladner (Alaska Airlines), and the FAA's NAC leadership team. He said that given the increasingly positive news on the pandemic, they felt it was important to begin paving the way for the return to in-person NAC activities, beginning with the NAC leadership convening for this meeting, then extending to the full committee as soon as feasible. He said that it is his goal to return to a completely in-person meeting for the Summer NAC Meeting.

Action: The NAC Committee Management Team will pursue options for holding an in-person Summer NAC Meeting, per the NAC Chairman's direction

Mr. Childs then provided the Chairman's Report. To begin, he called for a motion to approve the October 19, 2021 NAC Meeting Summary Package, which the NAC approved.

Outcome: The NAC passed a motion to approve the June 21, 2021 NAC Meeting Summary Package

Mr. Childs then provided a state of the industry update. He said that since the last meeting in October, the aviation industry has balanced several challenges. Over the winter, they navigated staffing challenges related to the Omicron variant, as well as particularly severe winter weather across the country. He added that this was also amid the backdrop of responding to the 5G rollout. He said that while he believes there is cause for optimism that they are now in the final stages of significant pandemic impacts, with the Omicron variant continuing to recede and restrictions continuing to be eased across the country, there are still challenges ahead.

He said that the industry continues to work through challenges, and while they are in much better position than over the winter, he wants to emphasize the urgency behind developing a long-term solution relative to 5G. He said he asked the Minimum Capabilities List (MCL) team to help start a roundtable discussion on whether there are any concerns or overlapping considerations with the MCL. He said he commends all FAA and aviation industry stakeholders for their work to mitigate the situation so far.

He said that another issue he wants to call attention to that is not garnering as much attention as it probably deserves is the industry-wide crew availability issue, which he said has become a significant concern area for operators, especially at the regional level. He said that thousands of COVID-related pilot retirements and steep demand recovery, has exacerbated what was already forecast to be a problem across the industry as schools struggle to certify—and airlines struggle to hire, train, and upgrade—pilots to keep up with the strong demand for air travel.

Mr. Childs said that another significant challenge to address is the barriers to entry for the commercial pilot career. He said the industry needs more minorities, women, and people of color in aviation, adding that the steep requirements and lack of available financing severely restricts this access. With the shared objective to make aviation careers more equitable and inclusive, now is the time for solutions. He said that solving this issue from an industry, training, and regulator perspective will be an absolutely critical component of continuing on the trajectory of a full aviation industry recovery.

He continued by saying that while the industry certainly has challenges ahead, there is reason for optimism. As reported in several media outlets recently, he said that domestic bookings for last month outpaced bookings for February 2019. He added that it is the first time the industry is seeing increases compared to 2019 levels since the start of the pandemic. He said that the American public is ready to travel again. Mr. Childs said he knows the aviation community is ready to meet these challenges and navigate the next phase of the recovery, but it is imperative to continue working together.

Mr. Childs then concluded the Chairman's Report. He said that before moving on to the FAA Report, he wanted to reach out to NAC Member Mr. Brad Pierce from the NOISE organization. Mr. Childs said that at the last NAC meeting, Mr. Pierce briefed plans to move out on forming a team to develop some thoughts on how the NAC might provide greater support for the FAA's community engagement efforts. Mr. Childs said that it is his understanding that Mr. Pierce had formed a team and held some meetings. He handed off to Mr. Pierce provide the NAC an update on progress.

Industry Forum on Community Engagement Update

Mr. Pierce reviewed the group's objective to identify best practices and touch points on how the NAC can encourage broader aviation industry participation in the FAA's existing community engagement structure. He continued by thanking and reviewing the list of participants that consisted of NAC Members and designated NAC SC member representatives, including N.O.I.S.E., JetBlue, Delta Southwest, Professional Aviation Safety Specialists (PASS), Airbus, Boeing, Port Authority of New York and New Jersey (PANYNJ), NATCA, Air Traffic Control Association (ATCA), and Honeywell.

He indicated that he hopes these initial meetings will spur more and thanked the NAC for giving them the platform. He said that this was the beginning of ongoing collaboration focused on relationship building and shared communication. He reported that Ms. Beth White (FAA) initially briefed the team on the FAA's existing community engagement structure to level-set what the FAA has done. Mr. Pierce then provided some examples of success / best practices the team discussed, including success stories from Metroplex projects (specifically mentioning Las Vegas) and participation in roundtables increasing awareness. Mr. Pierce concluded by indicating that they look forward to continued collaboration. Mr. Pierce then handed off to Mr. Childs.

Mr. Childs thanked Mr. Pierce and the team for spearheading the effort. He said he is a firm believer that involving communities often and early as possible in planning benefits everyone. He said that as they move forward, he asks that all NAC Members keep the team's findings in mind as they strive as an aviation community to improve.

Mr. Childs then handed off to Mr. Bradley Mims, FAA Deputy Administrator and NAC Designated Federal Officer (DFO), for the FAA Report.

FAA Report

Mr. Mims began by sharing that beginning next week, Captain Billy Nolen will become the acting FAA Administrator after Mr. Dickson departs the FAA. He said that many have gotten to know Captain Nolen since he joined the agency in January to lead the Office of Aviation Safety. He is an experienced and accomplished aviation safety professional and former airline captain. He has held safety leadership positions at Qantas Airways, Airlines for America, and American Airlines. Mr. Mims said that Captain Nolen has a passion for helping the agency reaffirm its global leadership and using new tools and data to ensure it continues to provide the safest and most efficient aerospace system in the world. He added that he knows Captain Nolen will lead the FAA with integrity and passion for its safety mission.

He said that he is also pleased to share that on April 11, the FAA will begin a three-week phased transition to bring the rest of the workforce back into the workplace. He said this will conclude the more than two-year period the FAA has had a portion of its employees and contractors in maximum telework status. He thanked the many employees that have persisted with critical on-site functions throughout the pandemic. He said that while this completed transition will not look the same as it did before COVID, the FAA is eager to press forward with this new normal. He said the agency remains committed to providing a safe, sustainable, and equitable aerospace system and that the FAA will continue to keep the NAC informed as they make this transition.

While the FAA focuses on internal change, he said they are also looking at an industry that is different in many ways than it was before the pandemic. He said they are seeing differences in traveler destination

preferences and travel frequency. Mr. Mims said that as they work to understand and adapt to these changing dynamics, he is pleased to share how the FAA is investing in aviation infrastructure through the Bipartisan Infrastructure Law (BIL). The BIL invests \$25 billion in airports and air traffic facilities. Not only will the changes in demand mean that airports need more capacity, but the airports will also need to be sustainable and community-focused. The BIL will provide \$20 billion for airports, including \$15 billion for infrastructure grants and \$5 billion for terminal improvements. He said that in December, DOT released the first round of airport grants. Airports can use the money for runways, taxiways, safety and sustainability projects, as well as terminal, airport-transit connections, and roadway projects. The BIL also provides \$1 billion per year, over five years, to provide the FAA's aging air traffic control facilities and equipment with much-needed replacements and upgrades. Mr. Mims said they will use this funding in concert with the FAA's Facilities & Equipment program to address more locations more quickly than they could within the previous budget. The funding will allow for the replacement of old infrastructure, including many FAA-owned operational facilities, such as air traffic control towers, thus putting the FAA on a path for long-term sustainability.

Mr. Mims highlighted efforts to maximize the benefits of Diversity, Equity, Inclusion, and Accessibility (DEIA) at the FAA and throughout the aviation and aerospace industries. He said they want to attract the best, brightest, most diverse group of people to be part of aviation and aerospace fields. He said when they have people with diverse perspectives, they can look at things from every angle, make better decisions, innovate at greater rates, and solve problems faster. Internally, the FAA is diversifying the FAA talent pool by restructuring its recruitment and hiring processes. He said they are seeing great results by reaching out to a broad group of educational organizations including Historically Black Colleges and Universities; Hispanic Serving Institutions; and Tribal Colleges and Universities. He said they also continue to bring interns on board from diverse backgrounds through the Minority Serving Institutions Intern Program for graduate-level and undergraduate-level students. He added that they have also formed strategic partnerships with several organizations that make DEIA and underrepresented community outreach a priority, such as Women in Aviation International, the Organization of Black Aerospace Professionals, Veterans' groups, as well as numerous FAA employee associations, such as the National Black Coalition of Federal Aviation Employees. He added that the FAA recently received recommendations from the Women in Aviation Advisory Board on how the FAA can further improve education and career outreach to women and girls. He said that later this year, the FAA's Youth Access to American Jobs in Aviation Task Force will recommend ways to improve outreach to all young people and students. He said as the FAA commits to building a more inclusive work culture where everyone feels accepted, respected, and heard, the FAA will abundantly benefit from everyone's unique talents, skills, contributions, and perspectives. He said they do this, not only because it's the right thing to do, but also because they must have a broad range of expert opinions at the table to make sure they haven't missed anything when it comes to safety.

He said that today's FAA Report will focus on a wide range of topics to provide the NAC with insight into what the FAA has been working on since the October 2021 NAC Meeting. Before handing off to Mr. Dickson for insights, he announced that Mr. Dickson is stepping down from his role, indicating that they are thrilled to have the chance to hear from him for one more time as FAA Administrator at a NAC Meeting. He clarified that Mr. Dickson's departure does not change anything for the NAC DFO position or engagement, but added that the FAA will keep the NAC updated as it continues the transition. Mr. Mims then handed off to Mr. Dickson.

Mr. Dickson began by saying that he will be leaving the FAA at the end of this month. He said that after more than 43 years as an aviation professional, it is time for him to go home and devote his full attention to his family. He said he loved working through problems and solving issues and that the agency is on a positive trajectory. He added that Mr. Nolen and Mr. Mims will continue to move the FAA forward.

He said that he is tremendously proud of everything they have accomplished together in the NAC over the past decade-plus. As a NAC member, first from industry, and now with Government, he knows, firsthand, that continued collaboration with the NAC will be crucial to the ultimate goal of NextGen operationalization. He said he brings this perspective as the last chairman of the Air Traffic Management Advisory Committee (ATMAC), a former NAC Member, and a former NAC SC chairman.

Mr. Dickson said that as he looks back on his time as FAA Administrator, he is especially proud of how the aviation community has continued to ensure safety despite the unprecedented challenges the pandemic presented. He said that the FAA and industry have delivered tremendous value to public. He added that they have all learned during the process and moved forward with resiliency and resolve. He said that the challenge for this year and the future is to continue to deliver safety, efficiency, and innovation in an environment of constant change. He said there is some tension between change and safety. To move forward, he said they have to do that in a methodical and systematic way. He said he is confident that the aviation community will step fully into the "new normal" in the coming months so they can chart the future together.

Mr. Dickson said they must also embrace the excellent opportunities in front of them, adding that they cannot just think about challenges. He specifically mentioned orbital and suborbital space tourism, automation, drones, and advanced air mobility, clarifying that at the same time also managing the ever-changing landscape of threats like cyber-attacks, climate change, and global public health emergencies like COVID-19. He said they must plan as if disrupters are the norm, not the exception. That means being resilient and always vigilant. He said throughout all of this, the FAA must continue collaborating with industry to make sure they have an aerospace system that meets the needs of stakeholders.

He said that the FAA is also turning the keys over to the next generation of leaders. He said that in addition to his departure, they have some important positions to fill with recent retirements, including Ms. Pamela Whitley, Ms. Teri Bristol, and Mr. Wayne Monteith. He said there are tremendous opportunities for emerging leaders in the FAA and the plan is to fill them as soon as possible. He said that fortunately, they have amazing people filling in those roles as the FAA conducts a thorough search for the best candidates.

Mr. Dickson said he wants to briefly comment on some of the realities the agency faces as they emerge from the pandemic and work to reassess programs, which he mentioned are challenges that the FAA and aviation industry have to tackle together. He said many FAA program schedules and waterfalls were significantly impacted by the necessary safety limitations on travel and on-site access to air traffic facilities. To accommodate these limitations, the FAA has had to stretch some of timelines well in to the future for many programs, including some NAC-NextGen priority focus areas. He said they are weighing the budgetary implications and impacts to other programs in the pipeline as a part of the overall program assessment. He said that as they make some challenging decisions about the future, they want to ensure they stay connected with the NAC. He mentioned that they have had to reprioritize before, during sequestration, which he said created similar challenges. He said they have seen this coming for a long time. With COVID now receding, they are finally able to start re-forecasting so they can have

these important conversations. He mentioned Mr. Tim Arel (FAA) will discuss this further later in the meeting.

Mr. Dickson said he also wants to emphasize opportunities to make progress outside of focusing on programs. Take the New York TRACON as an example of operational improvement. He said everybody knows there is a huge benefit if they can solve flow restrictions through shifting resources. This is something that is already paid for, does not cost a lot, and has a huge impact. To alleviate training certification issues, the FAA is moving the Newark sector covering Newark Liberty International and Teterboro airports to be controlled by the Philadelphia TRACON so that the New York TRACON can continue to focus on LaGuardia, JFK, and Islip. He said the change will not only help staffing and training issues in New York, but also make it easier to implement new procedures and other NextGen improvements that would make New York airspace much more efficient. He said the Northeast Corridor has been and continues to be a NAC priority focus area. He said the FAA has been collaborating with the industry in other forums, but wants to make sure the NAC has visibility on this as well. He said this is just one example of the non-programmatic ways they can continue to make progress working together with the NAC.

Mr. Dickson said they are also closely monitoring the post-COVID traffic trends. He said they have seen significant changes in demand, mentioning that business, cargo, and general aviation are all up. He said through ongoing efforts like the ATO Focus 5, they are leaning in on reducing delay through more precisely implementing miles-in-trail restrictions and improving compliance with traffic management initiatives. He said they have succeeded in reducing miles-in-trail usage by over 25%, while increasing traffic management initiative departure compliance by over 10%. These efforts have directly contributed to overall NAS delays being down 43% from baseline, even though traffic is back. He said this is a result of a joint commitment to collaboration and coordination, and it's the kind of performance benefit they can continue to derive while working through the after-effects of the pandemic on program implementation.

Mr. Dickson said he asked Mr. Arel to speak about collaboration and coordination opportunities in Central Florida a bit more during his comments. He said this area of the NAS, even more than the Northeast, is where the traffic flows are building. Several Florida airports are up 15-20% on any given day compared to pre-pandemic. Jacksonville Center and Miami Center are running above the historic baseline, while many Florida airports, especially Orlando, are experiencing high traffic challenges. He said that Tampa was up over 20% compared to pre-pandemic numbers over the weekend. He said he has encouraged Mr. Arel to pull industry together to look at Central Florida holistically to see if there any potential opportunities for industry and the FAA to work collaboratively to seek strategies that might result in performance benefits.

Moving on to other NAS operator news, he said FAA-licensed commercial space operations have increased and will likely continue to increase. In FY21, there were 59 launches and 5 reentries, which is nearly double from the year before. In April, the FAA will implement a new procedure to improve NAS safety in the event of a commercial space launch mishap, called Debris Response Area. On the regulatory front, this spring the FAA intends to issue a proposed rule to mitigate the creation of orbital debris. The agency is also taking numerous actions this year to prepare for the possibility that Congress will let the current moratorium on human spaceflight safety regulation expire in October 2023. He said they also continue planning for increased operations in other airspace domains, including drones,

Advanced Air Mobility (AAM), and Upper Class E airspace. He said that the FAA's goal is to enable innovation, but it has to be done safely. With these types of entrants, they have to understand the types of vehicles, and the types of operations. They have to look at whether the envelope of current regulations is large enough to accommodate these new airspace operations. Also, from a traffic management perspective, much of the new entrant integration still utilizes the construct of managing a trajectory, and more importantly, communicating that information between systems. He said they will continue to work with industry to develop and validate Concepts of Operation and evolve consensus-based standards, which provide the technical underpinning for true integration.

Mr. Dickson said that with all of this innovation happening, and thinking about the progress we can make through continued collaboration, this is an exciting time in aviation. He thanked the NAC for its engagement over the years. He said he looks forward to cheering them on from afar as the aviation community continues to meet the evolving needs of the American flying public. He said it has been an honor and privilege to serve. He then handed off to Mr. Mims.

Mr. Mims then handed off to Mr. Childs to comment on Mr. Dickson's retirement.

Mr. Childs thanked Mr. Dickson on behalf of the NAC for all he had done during his time as FAA Administrator, and throughout his decorated aviation career. He said he recently read in a news report that Mr. Dickson leaves a legacy of achievements, and that he couldn't say it any better. He said Mr. Dickson entered as Administrator during an incredibly challenging time, and he said they have appreciated his steady hand and unwavering commitment to safety through the industry's greatest crisis in COVID and for his continued support with unruly passengers.

Mr. Childs said that he has appreciated Mr. Dickson's consistent availability and effort to maintain the NAC work as a priority through this very choppy couple of years. He said the aviation world is forever changed because of Mr. Dickson. He added that it has been a privilege to work with Mr. Dickson and he has left a lasting, positive impact on aviation. Mr. Childs opened the floor for additional NAC Member comments.

Several NAC Members thanked Mr. Dickson for his contributions. Mr. Childs then handed off to Mr. Mims.

Next, Mr. Mims handed off to Mr. Paul Fontaine, Acting Assistant Administrator for NextGen.

Mr. Fontaine provided an initial FAA response to the MCL annual review advice approved at the October 2021 NAC Meeting in response to NAC Task 21-1. He said the FAA appreciates the initial response and is supportive of plans to further explore assumptions that need re-evaluation, changes in scope or technologies, and recommendation on steps to further drive MCL adoption. He added that ensuring the MCL items remain relevant and up to date is foundational to the joint FAA and NAC understanding of aircraft equipage in relation to operationalizing NextGen and future airspace modernization efforts. He noted that despite the pandemic, the FAA is excited to continue seeing equipage rates rising through new aircraft deliveries. He said they look forward to the continued widespread adoption of the MCL. Mr. Fontaine then handed off to Mr. Mims.

Next, Mr. Mims handed off to Mr. Tim Arel, Acting Air Traffic Organization Chief Operating Officer. He mentioned that Mr. Arel recently took over for Ms. Bristol after her retirement at the end of February and will represent the Air Traffic Organization at NAC and NAC Subcommittee meetings moving forward.

Mr. Arel provided a State of the NAS briefing, which he framed as an opportunity to re-synchronize the collective understanding of the NAS with stakeholders. He explained the following aspects of current NAS operations:

- Airlines reporting 88% pre-COVID vs NAS operating at 95%
- Portions operating well above pre-COVID levels, including regionally (FL, CA, Ski Country), General Aviation / Business Aircraft, special events, and cargo
- Acknowledged challenges oil prices, crew availability, return of international travel

Mr. Arel then reviewed the February 2022 NAS Traffic Level Summary (depicted below), notably that 290 of 523 OPSNET Airports were operating at or above their baseline.



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

He also provided the following staffing and training status update:

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

Mr. Arel then explained the FAA's "math problem" where flat budgets and COVID absorption of additional costs means that FAA can't afford to do everything it said in the time it originally said. He

said they are looking forward to collaborative conversations with industry to help prioritize NAC commitments.

He closed by mentioning that he asked his team to convene a meeting in the next month or two to build a problem statement for Central Florida focused on identifying problems and operational efficiencies to be gained. He said there will be a meeting announcement in the next couple weeks. He then handed off to Mr. Mims.

Mr. Mims then handed off to Deputy Associate Administrator for Aviation Safety, Mr. Chris Rocheleau.

Mr. Rocheleau provided a preview of the AVS briefing later in the agenda focused on electric propulsion aircraft intended to utilize traditional aviation airspace that will close out an action from the October 2021 NAC Meeting. He said this briefing will level-set a common understanding of this aircraft engine technology, as well as the short-term and mid-term expectations for integrating this technology in the airspace. He said he expects electric propulsion aircraft to have the same capabilities as traditional aircraft equivalents without adverse impact to operations, even in the event of widespread adoption.

He then provided a situational update on 5G rollout. He said the FAA continues to see and believe 5G and aviation can coexist. He said they are working closely with interagency partners to identify opportunities to collaborate earlier on issues that impact aviation safety. He said they are working on new standards for altimeters in the presence of 5G signals, as well as working to approve filters that he said will be in carriers' best interest to install quickly. He then handed off to Mr. Mims.

Mr. Mims concluded the FAA Report and handed off to Mr. Childs.

Chairman's Roundtable

Mr. Childs thanked Mr. Mims and introduced the Chairman's Roundtable agenda item. He said the Chairman's Roundtable is intended to be a continuation of a concept the NAC is building upon from the last three NAC meetings. He reminded the NAC that this is the time for committee members to explore ideas and issues with the benefit of fellow NAC Member expertise. He said that, as he mentioned earlier, today's topic is focused on whether the 5G situation introduces any considerations the NAC needs to be aware of or discuss for the MCL. He said he asked the MCL team to develop a short briefing to get this conversation going. He requested that his discussion remain focused on how the situation impacts the MCL, as opposed to commentary on the larger situation that is occurring in other forums. Mr. Childs handed off to MCL Lead, Mr. Ron Renk (United).

Mr. Renk's briefing to set the stage for the roundtable discussion focused on providing an overview and background (reference Attachment 1 for the detailed slides) on the following:

- Whether radar altimeters belong on the MCL
- Whether the MCL team should work resiliency issues
- How to prevent future conflicts
- Lessons learned

Mr. Renk then handed off to Mr. Childs, who opened the roundtable discussion. Notable roundtable comments include:

• Mr. Brian Quigley (United)

- Since MCL focused on forward-fit, carriers will equip with altimeters not impacted by the 5G issue
- Wants to be careful not to use MCL as filter for safety issues
- In context of budget discussion, mentioned risk of investing in something that gets deprioritized down the road

• Mr. Patrick Burns (Delta)

- Don't want to see MCL used for everything—also don't want it to be redundant but needs to look forward
- Where does it fit in to overall process—can it be a place to be preventative for what we are going through now with 5G?
- Mentioned having to look at all integration—does the MCL belong in a process of evaluating performance and risks to performance standards?
- Mr. Kimball Stone (American)
 - Mentioned everyone having a duty and obligation to ensure that resiliency and external dependencies/emerging risks, performance degradations are captured moving forward
 - o What that exactly looks like is up for discussion
- Mr. Warren Christie (JetBlue)
 - Discussed origination of MCL effort as an offshoot of NEC work
 - Raised concerns on whether the team has the tools or data to make a determination on spectrum interference
 - Said there needs to be a process to make sure when spectrum incursions or other things occur that agencies are talking to each other

• Mr. Don Dillman (FedEx)

• Mentioned that MCL team raised a hand to this issue early and this might be an opportunity to show how do we get more nimble in reaction

• Mr. Chip Childs (SkyWest)

- Described the NAC as the offensive side of the football—5G hit us from the defensive side of the ball
- Mentioned needing to design a better defense—I think it would be deluded if we took this to the MCL—need to keep that focused
- Suggested everybody stay deeply engaged and recommended evaluating some processes where we can communicate better outside the MCL team
- Mr. John Ladner (Alaska)
 - Mentioned possibility of developing a defensive posture work stream if things like 5G happen in the future

Mr. Childs thanked everyone for the great discussion and recommended the NAC further digest this information and let him know of any thoughts or ideas for further discussion on this topic as a committee.

FAA Topics

Next, Mr. Childs handed off to Mr. Mims to introduce the speakers for the FAA Topics agenda item.

Airspace Modernization Roadmap

Mr. Mims first handed off to Mr. Jim Arrighi (FAA) for an update on the Airspace Modernization Roadmap.

Mr. Arrighi began by saying that he appreciates the opportunity to address the NAC. He said that the FAA is developing the Airspace Modernization Roadmap as its strategic plan that will move away from single-site decision making to strategic, criteria-based decision making. He said they will use the NAC as the primary formal industry touchpoint. He added that they are going to make sure they stay with other forums and address the tactical level with local area levels. He said they think this refined regional approach is going to help the FAA optimize strategic oversight. He said they intend to continue to provide oversight from FAA Headquarters. He said they stood up Service Area Leadership Teams (SALTs) to determine regional priorities and modernization schedules. He said they want to base infrastructure priorities on analysis to provide optimal returns. He then reviewed the following updates:

- SALT stand-up meetings in March
- SALT assessment of initial sites for portfolio development in April
- Airport Portfolios under development NSG 1 & 2 airports
 - o Metrics based on quantitative and qualitative analysis
- FAA internal deliverables per Service Area by the end of the fiscal year
 - o 2 AMR project recommendations per service area

Mr. Arrighi then handed off to Mr. Mims.

Section 547

Next Mr. Mims handed off to Mr. Juan Narvid (FAA) for a status update on the Section 547 activity.

Mr. Narvid indicated that he is stepping in for Mr. Shawn Kozica (FAA). He began with a summary review of the Section 547 congressional language. He then provided an overview of the selected Section 547 initiatives, including the following:

- 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)

Mr. Narvid then indicated that they had received positive feedback from the workforce on these initiatives. He added that operational data is being assessed for benefits and metrics discussions are ongoing. He said that the plan is to report on data collection at the next NAC Meeting.

Mr. Burns commented that it is great work by the whole team. He added that when they are looking at analysis, mentioning LA as an example, he does not want to miss the opportunity to measure benefits, including FAA, community, and carbon footprint benefits.

Mr. Narvid indicated that they can use the data in to measure carbon emissions as well. Mr. Burns commented that he wants to make sure they look a layer deeper as they add additional items. Mr. Narvid agreed to have the team add carbon emissions to the benefits assessment.

Mr. Christie commented that this has been a long project and that it is nice to see them starting to collect data. He encouraged continue collaboration with industry on metrics. He said that once they see benefits it will enable further investing. He said collaboration around metrics is important so they all share benefits.

Electric Propulsion

Next Mr. Mims handed off to Mr. Chris Hope (FAA) for a briefing on the FAA's view of electric propulsion (EP).

Mr. Hope said that the FAA is using many different certification approaches for aircraft with electric engines, including the following examples:

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

He said that the FAA is seeing two general types of engines—all electric and hybrid-electric. He indicated that the FAA has several projects in the works develop flight standards and procedures to advance electric aircraft utilization. He reviewed the following considerations for successful electric propulsion introduction:

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

Mr. Hope then handed off to Mr. Mims.

Mr. Mims concluded the FAA Topics agenda item and handed off to Mr. Childs.

NAC Subcommittee (SC) Chair's Report - NAC Taskings Status

Next, Mr. Childs handed off to NAC Subcommittee Chairman, Mr. John Ladner (Alaska), who walked through the current NAC SC issues with the working group leads. He began by reviewing the NAC SC Chairman's Report topics. Before handing off to the first briefer, Mr. Ladner announced that Mr. Brian

Townsend (APA) has stepped down as PBN NIWG Co-Chair, but will continue on as a member. He thanked Mr. Townsend for his many contributions over the years as a Co-Chair and said they look forward to his continued engagement as a member. He then said he is pleased to announce that Mr. Eric Morse (Delta) has accepted the nomination to become a Co-Chair of the PBN NIWG along with current Co-Chair Mr. Bill Whyte (RAA). Mr. Ladner thanked Mr. Morse for accepting the nomination and said they look forward to benefiting from his experience. Before moving on, he noted that the the PBN NIWG had nothing significant to report and yielded their time.

NAC Task 21-1: Minimum Capabilities List (MCL) Annual Review

Next, Mr. Ladner handed off to MCL Ad Hoc Team Lead, Mr. Ron Renk (United). Mr. Renk provided a brief update focused on the order of the team's ongoing work to prepare for a fall briefing to the NAC, including:

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

He reported that the team is off to a good start with lots of work ahead. He indicated the meeting cadence is two-hour meetings every two weeks through late Summer. He then handed off to Mr. Ladner.

Northeast Corridor (NEC)

Next, Mr. Ladner introduced the Northeast Corridor team with Mr. Wilkins, Mr. Narvid, and Ms. O'Connor from the FAA and industry co-chairs Mr. Ralph Tamburro (Port Authority of New York and New Jersey) and Ms. Lee Brown (JetBlue). Ms. Brown reviewed the following NEC Focus Area updates:

- Advancing NAC-recommended "NextGen Opportunities" toward regular operational use
 - o Public LGA Runway 31 GPS RNAV Approach on March 24th
- Completing milestones and operationalizing commitments
 - o Improved airspace efficiency with Atlantic Coast Routes by Q4 2022
 - o Improved access with GBAS at JFK & LGA starting in Q1 2023
 - o Improved flow efficiency with time-based metering for PHL and EWR by Q4 2024
- Understanding and contributing to initiatives connected with the NEC
 - o Other relevant TBO implementations
 - o NEC VOR MON efforts
 - o MARS and dependent EoR safety studies
 - o PANYNJ Part 150 studies and Fly Quiet Program

The team then provided an outlook overview of NEC commitments detailed in the following graphic:

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

Mr. Quigley thanked the NEC team for the great work. He mentioned that he thinks the NEC team needs some visibility on the Newark airspace transfers that Mr. Dickson mentioned earlier in the meeting. Mr. Arel commented that the FAA is willing to provide high-level briefings to the NEC team in line with briefings at the VP+1 and other forums.

Action: FAA ATO committed to providing situational updates to the NEC NIWG on the Newark airspace transfers in line with VP+1 and briefings in other forums

Multiple Runway Operations (MRO)

Next, Mr. Ladner introduced the MRO team, including Mr. Natee Wongsangpaiboon and Mr. Raul Zamora from the FAA and industry co-chairs Mr. Phil Santos (FedEx) and Mr. Scott Dehart (Southwest Airlines). The team reviewed the following accomplishments:

- Completed the Consolidated Wake Turbulence (CWT) standards conversion at the last two sites;
 - o N90/EWR completed on 11/9/2021
 - o D01/DEN completed on 2/10/2022
- All MRO milestones for the current NJIP have been completed

Surface and Data Sharing

Next, Mr. Ladner introduced the Surface and Data Sharing team including Mr. Doug Swol and Mr. Ayaz Kagzi from the FAA and industry co-chair Mr. Rob Goldman (Delta). Mr. Goldman briefed the following current activities:

- Terminal Flight Data Manager (TFDM) program
 - Essential component of trajectory Based Operations (TBO)
 - o Supports improved throughput, reduced fuel burn, reduced emissions & sustainability goals

- o Builds on an info-centric NAS that leverages data exchange to integrate systems and users
- Industry Alignment with TFDM Waterfall
 - Front Load Config A implementations in current Config B slots
 - Departure metering can be activated when airport community ready
 - Understand staffing capabilities
 - Conduct regular interval reviews to seek opportunities to condense overall waterfall and reorder as needed
- Move all NYC airports (PHL, EWR, LGA, JFK, TEB, HPN) to Fall/Winter 2025
 - o System integration (i.e. DSP) is a NY priority
 - o Do not move TFDM implementation as a result of EWR \rightarrow PHL airspace changes
 - Do not move TBFM (PHL, EWR, LGA) implementation as a result of EWR-PHL airspace changes
- Next steps
 - o Continue to collaborate with TFDM program
 - o Leverage SWIFT, NASA and other organization engagements
 - Seek new opportunities that promote data exchange, NAS connectivity and shared goals of throughput efficiency and sustainability

Mr. Swol then provided a TFDM program overview depicted in the following graphic:

Electronic Flight Data (EFD) TFDM will provide an improved Electronic Flight Data (EFD) exchange and Electronic Flight Strips (EFS) in the tower to replace printed flight strips. This functionality will be integrated with Flight Plans for automatic updating.	Collaborative Decision Making for the Surface (S-CDM) TFDM will provide a departure scheduler with live data provided by Air Traffic systems/controllers and Flight Service Providers. The system will provide a departure metering capability, runway balancing and other surface management tools, improving surface traffic flow management.
Traffic Flow Management (TFM) TFDM will enhance the traffic flow management data integration with Time Based Flow Management (TBFM) and Traffic Flow Management System (TFMS) to enable airlines, controllers and airports to share and exchange real-time data. This will result in improved surface traffic management as well as improve the products produced by TFMS and TBFM.	Systems Consolidation TFDM will replace multiple unsupportable systems in the National Airspace System through integration of their functionality into TFDM. This achieves technology modernization, improved data sharing and lower maintenance costs. The systems to be consolidated include ARMT, DSP, EFSTS, AEFS, and SMA.

Mr. Swol then briefed the following TFDM Build 1 program status:

Key Site: Cleveland, OH (CLE)

- Accomplishments
 - o New TFDM draft waterfall reviewed with Surface NIWG on March 1st

- o Completed field implementation work at CLE, PHX, CLT
- o LAS Site Survey Completed
- o Completed Build 1.4 Risk Reduction Testing
- Planned Activities
 - o Formal 1.4 operational testing at the WJHTC starting on March 29th
 - o Formal 1.4 operational testing at CLE Summer 2022 (NAC milestone)
 - o CLE Build 1.4 IOC Fall 2022 (NAC milestone)

Key Site: Charlotte, NC (CLT)

- Accomplishments
 - o Build 2.1 software development and integration completed March 11th
 - o Continued vendor and flight operator testing
- Planned Activities
 - o Formal Build 2.1 software testing begins July 2022
 - Formal Build 2.2 software delivered to the FAA January 2023
 - o Continue onramping and test activities with vendors for the TFDM testbed

Mr. Swol then reviewed the following milestone update:

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

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



He then reviewed the following TFDM deployment map:



Mr. Swol concluded by reviewing the draft TFDM Waterfall Schedule depicted in the following graphic. He noted that this is still a draft and the FAA will work with industry to firm the waterfall by Fall 2022.

ATCT - Configuration - Functionality Deployed	АТСТ	Draft Post-COVID IOC	ATCT - Configuration - Functionality Deployed	АТСТ	Draft Post-COVID IOC
ATCT 5 (Cloveland, OH) Key Site		2024			
Config B - Build 1	CLE	October-22	ATCT 6 (Los Angeles, CA) - Config A	LAX	February-24
0000		ATCT 28 (Oakland, CA) - Config B		OAK	March-24
2023		ATCT 16 (Houston, TX) - Config A	IAH	April-24	
ATCT 4 (Indianapolis, IN) - Config B	IND	April-23	ATCT 15 (San Francisco, CA) - Config A	SFO	May-24
ATCT 1 (Phoenix, AZ) - <u>Config</u> A	PHX	May-23	ATCT 21 (Houston, TX) - Config B	HOU	June-24
ATCT 26 (Las Vegas, NV) - <u>Config</u> A	LAS	June-23	ATCT 40 (Cincinnati, OH) - Config B	CVG	July-24
ATCT 3 (Raleigh, NC) - Config B	RDU	July-23	ATCT 48 (Nashville, TN) - Config B	BNA	August-24
ATCT 20 (Columbus, OH) - <u>Config</u> B	CMH	August-23	ATCT 1 (Phoenix, AZ) - Config A, Adapt Build 2 func.	РНХ	September-24
ATCT 19 (San Jose, CA) - <u>Config</u> B	SJC	September-23	ATCT 29 (Seattle, WA) - Config A	SEA	October-24
ATCT 8 (Charlotte, NC) - Build 2 Key Site - <u>Config</u> A - Build 2 SW	CLT	October-23	ATCT 26 (Las Vegas, NV) - <u>Config</u> A - Adapt Build 2 <u>func.</u>	LAS	October-24
ATCT 30 (Tampa, FL) - <u>Config</u> B	TPA	October-23	ATCT 17 (Atlanta, GA) - Config A	ATL	November-24

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

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



TFDM Waterfall is still DRAFT

Data Communications (Data Comm)

Next, Mr. Ladner introduced the Data Comm team with Mr. Jesse Wijntjes from the FAA and industry co-chairs Mr. Chris Collings (L3Harris) and Mr. Ed Evans (Southwest Airlines). The team reviewed the following Data Comm Accomplishments:

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

The team provided an update on Data Comm operational status and benefits. Mr. Collings then reviewed the following 2021 Data Comm NIWG/Avionics Ad Hoc Focus Items:

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

The team then provided an overview of avionics updates detailed in the following slide:







Mr. Collings then reviewed the following Data Comm Avionics Ad Hoc Open Actions:

- Awaiting Airbus milestone for A220 avionics fix
 - o Airbus working on plan to address all open items IMA Build 8.0A3 expected Q4 2023
 - A Radio Interface Unit (RIU) update is currently being discussed to accompany the CPDLC changes in Avionics BL8.0A3 SW. Timeframe not confirmed yet.
- Airbus milestone for A350 avionics fix: End of 2022
 - Airbus launching new ACR standard to be available for new and retrofit aircraft by end of 2022
- Airbus milestone for A320 retrofit for ATSU older H/W: Q2 2022
 - o ATSU CSB 7.5.1 is planned, SB available Q2 2022
 - RDAF (Repair and Design Approval) to be released prior to the SBs availability to speed up retrofit
- Boeing milestone for CMU900 Core 16 production cut-in for B737MAX: End of 2022
 - Boeing plans to add Core 16 to TC for NLT end 2022 production introduction
 - o B737MAX customers may begin configuring aircraft deliveries with CMU900 Core 16
 - Actual new delivery availability based on customer configuration and delivery timeline
- Awaiting Boeing milestones for Nav Database revisions to mitigate en route STAR in free text for Pegasus II, B787, and B747 NG FMC
 - o B787 and B747 NG FMC will require an FMC update in addition to NDB changes
 - o Boeing does not have firm milestones for completion

Closing Comments and Adjourn

During the review of actions, in addition the items noted previously, the following additional actions were captured:

Action: The NAC Chairman requested that the NAC explore ways to make sure it is protecting investments to the extent possible, per the defensive posture conversation during the Chairman's Roundtable

Action: The NAC agreed that the NAC Subcommittee will provide expertise in the event the NAC receives a tasking from the FAA focused on NAC commitment prioritization

Mr. Childs then handed off to Mr. Mims for any closing comments. Mr. Mims recapped some of the key discussion items, then thanked the NAC for the continued engagement. Before concluding, he thanked Mr. Dickson for embracing him as Deputy Administrator. Mr. Mims then handed off to Mr. Childs.

Mr. Childs echoed Mr. Mims comments commending Mr. Dickson, then adjourned the meeting.



Attachment 1



NAC Meeting

March 28, 2022



Opening of Meeting

Chip Childs, NAC Chairman President & CEO, SkyWest, Inc.



Public Meeting Announcement

NextGen Advisory Committee (NAC) March 28, 2022





Public Statements

Members of the Public



Chairman's Report

Chip Childs, NAC Chairman President & CEO, SkyWest, Inc.

Motion for NAC Approval

October 19, 2021 – NAC Meeting Summary Package Draft





State of Industry Update

Chip Childs, NAC Chairman President & CEO, SkyWest, Inc.



Industry Forum on Community Engagement Update

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

Industry Forum on Community Engagement

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



Industry Forum on Community Engagement (cont.)

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

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





Brad Mims, FAA Deputy Administrator

NAC Designated Federal Officer



Steve Dickson, FAA Administrator



Paul Fontaine, Acting Assistant Administrator for NextGen



Tim Arel, Acting ATO Chief Operating Officer

State of the NAS

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



FAA Air Traffic Organization

Overview

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


NAS Operations

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



Feb 2022 NAS Traffic Level Summary

IFR Traffic

Category	Percent Change		
Total IFR	-7%		
Freight	4%		
GA	12%		
AC + AT	-11%		
International	-23%		
TSA	-16%		

ZSE -8%

ZOA -12%

apbox @ OpenStreetMap



0% or Better

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



Staffing & Training

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



F&E Overview

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



14% Pre/Post-Implementation 86% Mandatory Budget



Conclusion

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





FAA Report

Chris Rocheleau, Deputy Associate Administrator for Aviation Safety



FAA Report

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



Chairman's Roundtable

Chip Childs, NAC Chairman President & CEO, SkyWest, Inc.



Minimum Capabilities List (MCL) Discussion

Ron Renk (United Airlines)

Resiliency

- Definition of resiliency for MCL purposes *continuity of operations.*
- Radio Frequency Interference (RFI) concerns:
 - > Radar Altimeters (5G)
 - > GPS (Ligado, DoD testing, Personal Protection Devices)
- The billion dollar (literally) question we should be thinking about is who is responsible for resiliency and is it appropriate for the MCL?



How Did MCL Predict The 5G Problem?

- As MCL drives equipage requirements for forward fit, we must ensure value for the operator expense.
- Industry technical experts constantly monitor threats to the continuity of operations in the NAS.



Current Resiliency Concerns Spectrum Related

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



Does Radar Altimeter Need to be on MCL?

- RTCA SC-239 working to update the minimum operational performance standards for radar altimeters, RTCA DO-155/EUROCAE ED-30, to produce a new harmonized document for use in a FAA technical standard order (TSO) revision.
 - > Scheduled to be published in December 2022.
- Avionics OEMs will likely produce updated avionics and Aircraft OEMs will equip more robust Radar Altimeters.
- MCL requirement would likely be redundant in this case but still may serve a purpose.



Round Table Discussion Topics

- Is it appropriate for the Minimum Capabilities List team to work resiliency?
 - Example Pros ensures continuity of ops for NextGen equipage, provides some early warning.
 - > Example Cons non-NextGen equipage listed on MCL Matrix.
- How do we prevent future conflicts?
 - > Proactive vs reactive.
 - > Aviation has long lead times for "fixes".
- Lessons Learned?
 - > How do we get garner collaboration to solve issues between spectrum stakeholders?





FAA Topics

FAA



Airspace Modernization Roadmap Update

Jim Arrighi (FAA)

Airspace Modernization Roadmap Update

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





Section 547 Update

Juan Narvid (FAA)

Context: Summary of Section 547 Initiatives

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

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

SEC. 547. ENHANCED AIR TRAFFIC SERVICES.

(a) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Administrator shall establish a pilot program to provide air traffic control services on a preferential basis to aircraft equipped with certain NextGen avionics that—

(1) lasts at least 2 years; and

(2) operates in at least 3 suitable airports.

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

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

(d) DEFINITIONS .-

(1) CERTAIN NEXTGEN AVIONICS.—The term "certain NextGen avionics" means those avionics and related software designated by the Administrator after consultations with aircraft operators and manufacturers.

(2) PREFERENTIAL BASIS.—The term "preferential basis" means—

(A) prioritizing aircraft equipped with certain NextGen avionics during a Ground Delay Program by assigning them fewer minutes of delay relative to other aircraft based upon principles established after consultation with aircraft operators and manufacturers; or

(B) sequencing aircraft equipped with certain NextGen avionics ahead of other aircraft in the Traffic Flow Management System to the maximum extent consistent with safety.

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

132 STAT. 3378

PUBLIC LAW 115-254-OCT. 5, 2018

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

SEC. 548. SENSE OF CONGRESS ON ARTIFICIAL INTELLIGENCE IN AVIA-TION.



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= <u>Reduced</u> Flight Distance and Flight Time



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



ADS-B Out Equipage= <u>Reduced</u> spacing/distance flown



Section 547 Initiative Status

- Positive feedback received from workforce on initiatives
- Operational data being assessed for benefits and metrics discussions are on-going
 - > LAX Initiative
 - Distance and Time Savings
 - Throughput
 - > MCO Initiative
 - Airspace User Time Saved (gate and taxi delay savings)
 - Kgs of C02 Emissions Prevented
 - > ZOA Initiative
 - Eliminated Conflicts
 - More Efficient Maneuvers (to resolve remaining conflicts)









Electric Propulsion

Operations in the NextGen ATM Airspace

Chris Hope (FAA)

Electric Engine Development

• Electric Engine Certification Approaches

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

• Electric Engine Types

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

Electric Engine Installations

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



NextGen Flight Technology and Procedure Implementation

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





Electric Propulsion Introduction - Path to Success

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





NAC Subcommittee (SC) Chairman's Report

John Ladner, NAC SC Chairman (Alaska Airlines)



21-1: Minimum Capabilities List (MCL) Update

Ron Renk (United Airlines)

Meetings Resumed in February

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

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



Conclusion

- MCL team is off to a good start with lots of work ahead
 - > Meeting cadence to be roughly two hours, every two weeks, through late summer
- Likely order of work:
 - > Benefits Update
 - > Changes in Scope
 - > Assumptions that Need Re-Evaluation
 - > Refresher of Available Technology
 - > Recommendations to Drive Further Adoption





Northeast Corridor (NEC)

Aaron Wilkins (FAA), Juan Narvid (FAA), & Wendy O'Connor (FAA) Ralph Tamburro (PANYNJ) & Lee Brown (JetBlue)

- Advancing NAC-recommended "NextGen Opportunities" toward regular operational use
 - > Public LGA Runway 31 GPS RNAV Approach on March 24th
- Completing milestones and operationalizing commitments
 - > Improved airspace efficiency with Atlantic Coast Routes by Q4 2022
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- Understanding and contributing to initiatives connected with the NEC
 - > Other relevant TBO implementations
 - > NEC VOR MON efforts
 - > MARS and dependent EoR safety studies
 - > PANYNJ Part 150 studies and Fly Quiet Program



Outlook for Commitments

Туре	Commitment/Milestone	Jun 2021 NAC	Oct 2021 NAC	Current Dates
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Implementation*	PDRR/ABRR Enhancements	Q4 CY2021	Q4 CY2021	complete
Implementation*	Arrival time-based metering (TBFM) for PHL and EWR	Q4 CY2023	Q4 CY2023	Q4 CY2024
Industry	GBAS installation start at LGA	Q1 CY2023	Q1 CY2023	Q1 CY2023
Industry	GBAS installation start at JFK	Q1 CY2023	Q1 CY2023	Q1 CY2023
Industry	Evaluate multi-route TOS	Q4 CY2021	Q4 CY2021	complete
Industry	Additional tower space for TFDM at BOS**	TBD	TBD	TBD

 $\star\,$ Implementation and milestones are jointly shared by FAA and Industry for the NEC efforts

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





Multiple Runway Operations (MRO)

Natee Wongsangpaiboon (FAA) & Raul Zamora, Jr. (FAA) Phil Santos (FedEx) & Scott Dehart (Southwest Airlines)

MRO Milestones Updates (since October 2021 NAC)

Accomplishments:

- Completed the Consolidated Wake Turbulence (CWT) standards conversion at the last two sites;
 - > N90/EWR completed on 11/9/2021
 - > D01/DEN completed on 2/10/2022
- All MRO milestones for the current JIP have been completed





Surface & Data Sharing

Doug Swol (FAA) & Ayaz Kagzi (FAA) Rob Goldman (Delta Air Lines)

Surface & Data Sharing – Current Activities

• Terminal Flight Data Manager (TFDM) program

- > Essential component of trajectory Based Operations (TBO)
- > Supports improved throughput, reduced fuel burn, reduced emissions & sustainability goals
- > Builds on an info-centric NAS that leverages data exchange to integrate systems and users
- Industry Alignment with TFDM Waterfall
 - > Front Load Config A implementations in current Config B slots
 - Departure metering can be activated when airport community ready
 - Understand staffing capabilities
 - > Conduct regular interval reviews to seek opportunities to condense overall waterfall and reorder as needed
 - > Move all NYC airports (PHL, EWR, LGA, JFK, TEB, HPN) to Fall/Winter 2025
 - System integration (i.e. DSP) is a NY priority
 - Do not move TFDM implementation as a result of EWR \rightarrow PHL airspace changes
 - Do not move TBFM (PHL, EWR, LGA) implementation as a result of EWR-PHL airspace changes


Surface & Data Sharing – Current Activities (cont.)

• Next steps

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



Electronic Flight Data (EFD)

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



Traffic Flow Management (TFM)

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

Collaborative Decision Making for the Surface (S-CDM)

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



Systems Consolidation

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



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

Key Site: Cleveland, OH (CLE)

- Accomplishments
 - New TFDM draft waterfall reviewed with Surface
 NIWG on March 1st
 - Completed field implementation work at CLE, PHX, CLT
 - > LAS Site Survey Completed
 - > Completed Build 1.4 Risk Reduction Testing

• Planned Activities

- Formal 1.4 operational testing at the WJHTC starting on March 29th
- Formal 1.4 operational testing at CLE Summer 2022 (NAC milestone)
- > CLE Build 1.4 IOC Fall 2022 (NAC milestone)





EFS during Testing @ PHX



TFDM Build 1 Electronic Flight Strips Display



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

Key Site: Charlotte, NC (CLT)

- Accomplishments
 - Build 2.1 software development and integration completed March 11th
 - Continued vendor and flight operator testing
- Planned Activities
 - Formal Build 2.1 software testing begins July 2022
 - Formal Build 2.2 software delivered to the FAA January 2023
 - Continue onramping and test activities with vendors for the TFDM testbed



TFDM Build 2 Surface Management Display



TFDM Test Systems with EFS and SM Displays



NAC Milestone Impact

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

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



TFDM Deployment Map



TFDM Draft Waterfall Schedule (CY2022-2024)

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

ATCT - Configuration - Functionality Deployed	АТСТ	Draft Post-COVID IOC	ATCT - Configuration - Functionality Deployed	ATCT	Draft Post-COVID IOC
ATCT 5 (Cleveland, OH) Key Site -			2024		
Config B - Build 1	CLE	October-22	ATCT 6 (Los Angeles, CA) - Config A	LAX	February-24
			ATCT 28 (Oakland, CA) - Config B	OAK	March-24
2023			ATCT 16 (Houston, TX) - Config A	IAH	April-24
ATCT 4 (Indianapolis, IN) - Config B	IND	April-23	ATCT 15 (San Francisco, CA) - Config A	SFO	May-24
ATCT 1 (Phoenix, AZ) - Config A	PHX	May-23	ATCT 21 (Houston, TX) - Config B	HOU	June-24
ATCT 26 (Las Vegas, NV) - Config A	LAS	June-23	ATCT 40 (Cincinnati, OH) - Config B	CVG	July-24
ATCT 3 (Raleigh, NC) - Config B	RDU	July-23	ATCT 48 (Nashville, TN) - Config B	BNA	August-24
ATCT 20 (Columbus, OH) - Config B	СМН	August-23	ATCT 1 (Phoenix, AZ) - Config A, Adapt Build 2 func.	PHX	September-24
ATCT 19 (San Jose, CA) - Config B	SJC	September-23	ATCT 29 (Seattle, WA) - Config A	SEA	October-24
ATCT 8 (Charlotte, NC) - Build 2 Key Site - Config A - Build 2 SW	CLT	October-23	ATCT 26 (Las Vegas, NV) - Config A - Adapt Build 2 func.	LAS	October-24
ATCT 30 (Tampa, FL) - Config B	TPA	October-23	ATCT 17 (Atlanta, GA) - Config A	ATL	November-24

Sites with Green Box

are Build 1 or Build 2 key sites

Sites with Blue Box

are Configuration A sites receiving full TFDM functionality

TFDM Waterfall is still DRAFT





Data Comm

Jesse Wijntjes (FAA)

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

Data Comm Accomplishments

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



Data Comm Operational Status



Data Comm operational at 64 Towers

PBI planned for Summer 2022

Data Comm operational at 3 En Route Centers

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

Tower



ATC LOGON/STATUS LOGON TO TEL NO 57524 TALL NO ACT CIT STATUS TALL NO ACT CIT TALL NO ACT CIT ACT CIT TALL NO ACT CIT ACT CIT





Data Comm Benefits

Since 2016, CPDLC DCL...

Served 19 US Air Carriers and 70 Non-US commercial and cargo operators

- Cleared 12.05M+ flights
- Saved 2.24M+ minutes of air space user time
- Saved 3.09M+ minutes of radio time
 - Prevented 28.81M Kgs of CO2 Emissions
 - Prevented 150,800+ readback errors

Since 2019, En Route Data Comm...



- Served 18 operators
- Cleared 1,746,552 flights



- Saved 779,529+ minutes of radio time
 - Prevented 206,529 readback errors







2022 Data Comm NIWG/Avionics Ad Hoc Focus Items

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



Data Comm Avionics Updates Fleet Status

Aircraft operating in Data Comm en route - no pending actions

Operator & Fleet Actions Complete	Status		
Alaska Airlines: A321	Operating en route, no action required		
American Airlines: A321, B777, B78	Operating en route, no action required		
FedEx: B777, MD11		Operating en route, no action required	
Southwest Airlines: B737		Operating en route, no action required	
United: B777, B787	Operating en route, no action required		
UPS: B744, MD11	Operating en route, no action required		
Avionics Action	Operator/Fleet	Status	

Aircraft operating in Data Comm En Route with Crew Procedure Mitigation

Boeing 757/767 Pegasus 1	FedEx, UPS	Aircraft operating under procedure mitigation Avionics Fix: Q3 2022
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Aircraft operating in Data Comm En Route with Open Avionics Actions

Collins CMU 900 Core 16	Alaska , American, Delta, United	ASA starting installs in April, remaining operators delayed (COVID), aircraft operating
Airbus A320 ATSU CSB 7.5	Delta, JetBlue	Fix released Dec 2020, aircraft operating, installs 61% complete; investigating technical issue
Boeing 747-8 ATN-203	UPS	Planned – Q4 2022, aircraft operating

Aircraft not operating in en route due to Open Avionics Actions

Avionics Action		Operator/Fleet		Status	
Collins VDR Update	ollins VDR Update Alaska, United Install delayed (COVID), aircr		Alaska, United		ID), aircraft removed
Boeing 757/767 Pegasus 1		United		Pending Peg 1 Avionics Fix: Q3 2022	
Airbus A220		Delta, JetBlue		Pending avionics fix, planned Q4 2023	
Airbus A350		Delta		Pending avionics fix,	planned Q4 2022
Operating, no action required	Operating fix needed		Peg 1 op	perating with mitigation	Not operating





Data Comm NAC Open Action:

Boeing & Airbus to provide milestones for needed fixes

1. Awaiting Airbus milestone for A220 avionics fix

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

2. Airbus milestone for A350 avionics fix: End of 2022

✓ Airbus launching new ACR standard to be available for new and retrofit aircraft by end of 2022

3. Airbus milestone for A320 retrofit for ATSU older H/W: Q2 2022

- ✓ ATSU CSB 7.5.1 is planned, SB available Q2 2022
- ✓ RDAF (Repair and Design Approval) to be released prior to the SBs availability to speed up retrofit

4. Boeing milestone for CMU900 Core 16 production cut-in for B737MAX: End of 2022

- ✓ Boeing plans to add Core 16 to TC for NLT end 2022 production introduction
- ✓ B737MAX customers may begin configuring aircraft deliveries with CMU900 Core 16
 - Actual new delivery availability based on customer configuration and delivery timeline
- 5. Awaiting Boeing milestones for Nav Database revisions to mitigate en route STAR in free text for Pegasus II, B787, and B747 NG FMC
 - > B787 and B747 NG FMC will require an FMC update in addition to NDB changes
 - > Boeing does not have firm milestones for completion





Review of Action Items & Other Business

Kimberly Noonan, NAC Committee Manager (FAA)

Upcoming Meetings

• NAC SC

- > April 6, 2022 (2:00pm 5:00pm ET)
- > May 4, 2022 (2:00pm 5:00pm ET)

• NAC

- > Summer 2022 (TBD)
- > Fall 2022 (TBD)





Closing Comments & Adjourn

Chip Childs, NAC Chairman President & CEO, SkyWest, Inc.

NEC Read-Ahead & Back-Up Slides



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

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



Summary of Activities (since Oct 2021 NAC)

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



NJIP Commitment Summary

- Q4 2021 Completions
 - > DSP Enhancements (FAA Implementation)
 - > PDRR/ABRR Enhancements (FAA Implementation)
 - Evaluate multi-route TOS (Industry)
- Q1 2022 Completions
 - > Improved departure management for flights destined for LGA (FAA Implementation)
- Remaining implementation commitments still at potential delay risk
 - > Eastern seaboard high-altitude routes (Atlantic Coast Routes)
 - > Arrival time-based metering (TBFM) for PHL and EWR



Atlantic Coast Routes



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





Atlantic Coast Routes

Completed Implementation Milestones





Atlantic Coast Routes Sector Changes

ZDC High Altitude Sector Changes

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





NEC Inputs to "Opportunities" Discussion

- ★ LGA RNAV GPS approach to Rwy31: public instrument approach procedure that can provide a stable and guided path to the threshold of Rwy31, enhancing the safety
- ★ TEB/HPN escape routes: provides for an alternate route out of the airspace for capable business aviation aircraft
- LGA GLDMN and JFK 31L SKORR departures: use altitude separation to allow simultaneous departures; dispersal headings from LGA 13 provide departure efficiency; also improves efficiency by providing JFK with opportunities to utilize 31L for departures
- EWR 22L/29 operation: address the loss of a second landing runway at EWR during southwest to west winds, enabling a significant reduction in minutes of arrival delay
- LGA ILS 13 approach deconflicting TEB/EWR/LGA: deconflicts the three airports, to improve overall airspace operations and reduce the number of configuration changes

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



Northeast Corridor Accomplishments –

Moving forward on Opportunities Recommendations





Status of "Opportunities" Recommendations

- LGA Runway 31 approach procedure PARK Visual
 - > Collaborative Operator, Airport and FAA discussions
 - > Operator flight sims completed by late 2020
 - > FAA environmental review and flight check completed early 2021
 - > Data collection ongoing, feedback positive
 - > Public procedure on track for March 2022
- High-performance escape routes for TEB/HPN
 - Reviewed NBAA tabletop exercises from Fall 2019; feedback on viability of proposed climb gradients
 - > Additional test concerning climb parameters completed
 - > Procedures to be added to the escape route publication by end of 2021





Attachment 2



NextGen Advisory Committee (NAC) March 28, 2022 Attendance List

Last Name	First Name	Affiliation
Aguirre	Carlos	Professional Aviation Safety Specialists National
Allen	Daniel	FedEx Express
Arbuckle	Doug	Federal Aviation Administration
Arel	Tim	Federal Aviation Administration
Armstrong	Merrill	Federal Aviation Administration
Aron	Ludovic	European Union Aviation Safety Agency
Arrighi	James	Federal Aviation Administration
Asplen	Layla	Federal Aviation Administration
Ayelomi	Precious	Federal Aviation Administration
Baker	Mark	Aircraft Owners and Pilots Association
Baker	Ronald	Public
Banks	Jamie	Quiet Communities Inc.
Batchelor	David	SESAR JU
Вее	Lisa	Inmarsat
Bertapelle	Joe	Public
Bolen	Ed	National Business Aviation Association
Boyle	Virginia	Federal Aviation Administration
Braxton	Keisha	Federal Aviation Administration
Breitenfeldt	Rick	Federal Aviation Administration
Brown	Lee	JetBlue Airways
Brown	Steve	National Business Aviation Association
Bruckbauer	Brian	Air Traffic Control Association

Last Name	First Name	Affiliation
Bunce	Peter	General Aviation Manufacturers Association
Burke	Gregory	Federal Aviation Administration
Burkett	Alex	General Aviation Manufacturers Association
Burns	Patrick	Delta Air Lines
Butler	Steven	Federal Aviation Administration
Buttie	Steven	Department of Defense
Carroll	Ray	FedEx Express
Cebula	Andy	Airlines For America
Challan	Peter	L3Harris
Childs	Russell	SkyWest Airlines
Chow	Martha	Government Accountability Office
Christiansen	Cindy	Aviation-Impacted Communities Alliance (AICA)
Christie	Warren	JetBlue Airways
Collings	Chris	L3Harris
Cook	Charles	JetBlue Airways
Cowan	Durre	Federal Aviation Administration
Crandall	Kathy	L3Harris
Cuddy	Thomas	Federal Aviation Administration
Dalton	Rick	Southwest Airlines
Dao	Vince	Federal Aviation Administration
DeNicuolo	Mark	Federal Aviation Administration
Denning	Jana	Professional Aviation Safety Specialists National
DePete	Joseph	Air Line Pilots Association
Dickson	Steve	Federal Aviation Administration
Dillman	Don	FedEx Express
Donnelly	Kurt	Professional Aviation Safety Specialists National

Last Name	First Name	Affiliation
Donohue	Denis	Raytheon
Dowd	Jody	Federal Aviation Administration
Duffy	Kent	Federal Aviation Administration
Egentowich	John	Federal Aviation Administration
Evans	Edward	Southwest Airlines
Fontaine	Paul	Federal Aviation Administration
Fulton	Steve	Fulton Aviation
Goebel	David	Vashon Island Fair Skies
Goldman	Robert	Delta Air Lines
Gramaglia	Tom	Federal Aviation Administration
Griffin	Shannetta	Federal Aviation Administration
Gupta	Vipul	Honeywell
Gusky	Amy	Federal Aviation Administration
Guthrie	Roddy	American Airlines
Guy	Rebecca	Federal Aviation Administration
Heiss	Joshua	San Antonio International Airport
Hennig	Jens	General Aviation Manufacturers Association
Hicok	Daniel	Federal Aviation Administration
Hill	Fran	Leidos
Hollander	Anne	Montgomery County Quiet Skies Coalition, Ltd.
Норе	Chris	Federal Aviation Administration
lvers	Benjamin	Boeing
Jennings	Michael	Federal Aviation Administration
Johnson	Antionette	Federal Aviation Administration
Joly	Pascal	Airbus
Kamyab	Ahmad	Federal Aviation Administration

Last Name	First Name	Affiliation
Kasher	Alan	Southwest Airlines
Kauffman	Don	Honeywell
Kearns	Kathy	AlternaSource, Inc.
Kehrer	Alison	United Airlines
Kenagy	Randy	Air Line Pilots Association
Knorr	Dave	Federal Aviation Administration
Kohut	Anne	Airport Noise Report
Kovalcik	Luanne	Leidos
Lander	John	Alaska Airlines
Landesmann	Jennifer	Public
Landon	Joe	Lockheed Martin
Lawrence	Huntley	Port Authority of New York and New Jersey
Leone	Gregg	The MITRE Corporation
Lima	Cecilia	Embraer
Loring	Christopher	Federal Aviation Administration
Lunsford	Lynn	Public
Madera	Norbert	Federal Aviation Administration
Maffei	John	Federal Aviation Administration
Martin	Dave	Department of Defense
McClay	Jim	Aircraft Owners and Pilots Association
McDowell	Mike	Collins
Merkle	Michele	Federal Aviation Administration
Mims	Brad	Federal Aviation Administration
Moloney	John	The Boeing Company
Morrow	Clint	BridgeNet International
Morse	Glenn	Public

Last Name	First Name	Affiliation
Mulligan	Jessica	SkyWest Airlines
Nadarski	Nick	Government Accountability Office
Narvid	Juan	Federal Aviation Administration
Newman	Phil	American Airlines
Noonan	Kimberly	Federal Aviation Administration
O'Connor	Wendy	Federal Aviation Administration
O'Kelly	Caitlin	Federal Aviation Administration
Olson	Lee	NASA
Oswald	Chris	Airports Council International - North America
Pennington	Darrell	Air Line Pilots Association
Peyton	Bret	Alaska Airlines
Pfingstler	Susan	United Airlines
Pierce	Brad	N.O.I.S.E.
Quigley	Bryan	United Airlines
Quinn	Cheryl	NASA
Rehaluk	Jeff	Airlines For America
Renk	Ron	United Airlines
Rice	Colin	Port of Seattle
Rocheleau	Chris	Federal Aviation Administration
Ruehl	Steven	Department of Defense
Santa	Rich	National Air Traffic Controllers Association
Schwab	Gregory	Federal Aviation Administration
Shull	Mark	Public
Sinnett	Mike	The Boeing Company
Smith	Abby	Federal Aviation Administration
Smith	Ryan	United Airlines

Last Name	First Name	Affiliation
Snow	Marissa	SkyWest Airlines
Southers	Steven	San Antonio International Airport
Spero	Dave	Professional Aviation Safety Specialists National
Spurio	Кір	Raytheon
Stevenson	Dawn	Evans Consulting
Stockdale	Doreen	Interim SFO Roundtable Coordinator
Stone	Kimball	American Airlines
Sullivan	James	JetBlue Airways
Sultan	Akbar	NASA
Surridge	David	American Airlines
Swol	Douglas	Federal Aviation Administration
Tamburro	Ralph	Port Authority of New York and New Jersey
Thoma	Don	Aireon
Tranter	Emily	N.O.I.S.E.
Troxell	Chris	Federal Aviation Administration
Vlacich	Jeremy	AAAE
Ward	Rebecca	Public
Whyte	Bill	RAA
Wijntjes	Jesse	Federal Aviation Administration
Wildgoose	Laurence	Federal Aviation Administration
Wilkins	Aaron	Federal Aviation Administration
Willey	Doug	Air Line Pilots Association
Williams	Heidi	National Business Aviation Association
Williams	Tracy	Quiet American Skies
Wongsangpaiboon	Natee	Federal Aviation Administration
Yaplee	Darlene	Aviation-Impacted Communities Alliance (AICA) Concerned Residents of Palo Alto

Last Name	First Name	Affiliation
Yates	Vaughn	Federal Aviation Administration
Zagaroli	Lisa	Federal Aviation Administration



Attachment 3
March 28, 2022 NAC – Public Statements

Darlene Yaplee

Aviation-Impacted Communities Alliance (AICA) and Concerned Citizens of Palo Alto

The FAA Community Involvement Manual (February 2016) states:

• "Community involvement is the process of engaging in dialog and collaboration

with communities affected by FAA actions."

- "The views of communities including local residents, the general public and stakeholders..."
- "...ensuring that a balance of perspectives and experiences were considered..."

Yet, at the October 19th NAC meeting, the Community Engagement tasking and Mr. Pierce's action is to reach out to NAC members for industry-only conversations regarding the FAA's existing community engagement structure.

• Why industry-only conversations? Where is the "Community" in Community Engagement? This doesn't seem like a balance of perspectives. It excludes representation of impacted people near NextGen flight paths. In fact, of the 30 NAC members, there are zero who represent those directly impacted by NextGen single site or metroplex projects, or a Core 30 airport.

Previous NAC task groups on Community Involvement were unbalanced and excluded local residents. PBN Blueprint Community Outreach Group, June 2016 had a single "Environment" representative, again not from a NextGen project airport, whereas industry and FAA had 49 members including 6 Airports and 13 airlines (shout out to Delta who had 3 members). Blueprint for Success in Implementing PBN Group, October 2014 had 37 members, the same single "Environment" representative not from a NextGen project airport, whereas industry and FAA had 36 members including 5 airports and 8 airlines.

The term "Community" is misleading and inconsistent. The FAA uses it for airports, airlines, and even internal FAA. People near flight paths who are negatively impacted, are virtually excluded from any required FAA Community Engagement. In the spirit of the FAA's aim to build trust and be transparent, please cease using the term Community Engagement and call it what it is, Aviation Industry Engagement–unless of course you start including the Community.

Jennifer Landesmann

Member of the public. Not representing any organization.

My name is Jennifer Landesmann, member of the public. I've been studying the FAA's 12/21/21 <u>report</u> to Congress on Nextgen pursuant to Sec 502 of the 2018 Reauthorization and I found no details or financials on Nextgen's environmental activities, investments or projections. The report states that "NextGen represents a fundamental change from a government investment focused on adding short-term capabilities to aging infrastructure which lags behind industry innovation and public demand, to one developed in a collaborative partnership with industry to create a flexible, robust, and resilient infrastructure that meets future needs." But how is the financial accounting done for this partnership? I find it difficult to believe that zero dollars

have been invested in noise reduction yet there is a comment in the report that Nextgen has reduced noise over the last two decades. I follow how the FAA counts noise reduction around airports, which is by counting the reduction in population exposed to the 65 DNL contour, so it's a very different metric than say a reduction of noise on the ground for a Nextgen procedure. We are in the era of responsible investing and it is critical to instill transparency about environmental impacts in all financial reports. As a taxpayer and stakeholder in some of the billions that are in the project, I would like to suggest for the NAC to please improve the environmental disclosures made for Nextgen. Thank you.

Mark Shull

Member of the public (Palo Alto, CA). Not representing any organization.

Mark Shull, Palo Alto California

I'd like to bring up a situation that exists at San Francisco, and likely at other airports as well. That is maintenance on existing procedures. We see a steady stream of new initiatives, each generating side effects that cumulatively can build into serious problems. What we don't see are maintenance projects to detect and clean up these accumulated side effects.

Some background, following one discrete change several years ago, residents began reporting over energy problems, in the form of constant speed brakes, as planes exited the SERFR STAR, the main arrival over the San Francisco Peninsula. This has progressed to the point that some efficient planes are rarely able to descend without speed brakes.

These over-energy problems also showed up clearly in the AEDT BADA4 models SFO ran for its proposed GLS procedures as well as in actual industry GLS test flights. The final report noted that (quote) "existing approaches required significant energy reduction techniques." (unquote). Specifically, the test flights required higher flap settings, speed brakes and early deployment of landing gear, after exiting the SERFR structure and at altitudes between 6,000 to 3,000 ft..

At the same time, test monitors deployed during 2021 showed that between 10 and 17 percent of flights were also being directed below the 4,000 ft. Class B containment shelf at Palo Alto, which is close to a local GA airport and GA flyways.

In addition to creating unnecessary noise, these issues would seem to affect fuel consumption, workload and safety. Our frustration is that while we see project after project for new, we see no maintenance programs to detect and remediate these types of accumulated unintended side effects from previous projects, even when they are well documented. We believe that such remedial maintenance programs are warranted and would benefit both citizens and the industry as well.

Thank you.

March 28, 2022 NAC – Written Statements

Cindy L. Christiansen, PhD Aviation-Impacted Communities Alliance (AICA)

One area of focus for your meeting today is Risk and Mitigations for Multiple Runway Operations. When working on this topic, I ask that the NAC also include discussion and feedback to the FAA on how this topic relates to FAA Order 8400.9 National Safety and Operational Criteria for Runway Use Programs. This order was issued 40 years ago and continues to exist in its original form today despite very significant changes to navigation methods and capacity demands, both of which have detrimental effects on the health and quality of life of people who live in communities that have been harmed by the FAA's implementation of NextGen.

The July 2015 minutes of the Air Traffic Procedures Advisory Committee Meeting reports that the 8400.9 Revision Working Group had been meeting since 2013 to address safety concerns and operational realities related to this Order. In 2017 there was an attempt to amend the order to provide a process for determining the maximum crosswind and tailwind components for each runway at an airport. To my knowledge that attempt to amend Order 8400.9 was futile.

Work to amend this Order provides the FAA an opportunity to show that it is committed to safety with respect to multiple runway use and selection given changes brought about by NextGen procedures that increase capacity and decrease spacing of procedures. I also ask that if Runway Selection Safety Teams are created at individual airports, as the 2017 amendment would require, that the Order also requires that the Team include people from communities that are negatively affected by NextGen procedures.

David Goebel Vashon Island Fair Skies

Thank you for this opportunity to present comment. My name is David Goebel and I'm the president of Vashon Island Fair Skies, a 501(c)3 formed in the wake of PBN implementation at KSEA as part of the Greener Skies Project.

Specifically, two RNAV STARs were added for Westside arrivals, and due to the geography and weather in Seattle, the Southflow downwind HAWKZ procedure is the most heavily used, accounting for approximately half of arrivals in Southflow.

I wanted to comment on a topic discussed at the November 2020 NAC meeting: VNAV or Vertical Navigation. While it's undeniable that lack of VNAV capabilities make approaches not completely optimal, I would argue this inefficiency is dwarfed by the negative consequences of, ironically, OPD Optimum Profile Descent – at least at an airport like KSEA with a very high arrival rate.

The problem stems from the cookie cutter rigidity that an OPD enforces on the commencement of descent from cruise for a downwind leg. This start of descent is calibrated assuming a specific U-turn point in the downwind leg for an optimal descent all the way to the runway. That's what's supposed to happen. What actually happens is that arrivals are constantly backed up, so ATC pushes that Uturn point further and further from the airport. At KSEA sometimes dozens of miles from the airport. What this means is that when arrivals

reach approx 4000 feet and should be starting their RNP U-turn, they instead are vectored straight and level to the new U-turn point. The net result is that the OPD can actually increase level flight, dramatically, and worse, those level segments tend to be at lower altitudes than pre-OPD. Pilots call this "coming in dirty" and is the worst possible configuration for noise, pollution and Greenhouse Gas emissions.

Section 214(d) of the 2012 FAA re-auth act required the FAA to release certain precisely defined metrics concerning the implementation & results of NextGen. These were published on the "NextGen Performance Snapshot" web page, which has since been taken down. The published numbers showed that OPD implementation at KSEA increased length in level flight per arrival by ~60%.

<as time allows> Pre-NextGen ARTCC & TRACON had the freedom to optimize arrivals based on the actual current arrival rate at KSEA. During busy times when downwind legs were extended, the start of descent could be delayed, keeping arrivals cruising higher longer and what level-offs there were could be done at higher altitude, where the noise impact was much less. I strongly suggest you go back to these procedures to allow for truly optimized descents.

Thank you again for this opportunity to speak. It is refreshing to not have to hold back deep technical content and genuinely feeling that the audience understands what I'm talking about.

If any of you will be at the UC Davis Noise & Emissions symposium in May, I look forward to meeting in person to discuss this and other topics. My email is david@vifs.org. </as time allows>

Thank You.