Meeting Summary, October 8, 2015

NextGen Advisory Committee (NAC)

The sixteenth meeting of the NextGen Advisory Committee (NAC) was held on October 8, 2015 at FedEx Express, Memphis, TN. The meeting discussions are summarized below.

List of attachments:

- Attachment 1 - Attendees
- Attachment 2 - Presentations for the Committee meeting - (containing much of the detail on the content covered during the meeting)
- Attachment 3 - Approved June 5, 2015 Meeting Summary
- Attachment 4 - NAC Chairman’s Report
- Attachment 5 - FAA Report from The Honorable Michael Whitaker, FAA Deputy Administrator

Welcome and Introductions

Chairman Anderson opened the meeting at 8:45 a.m. by welcoming the NAC members and others in attendance. He recognized meeting host David Cunningham, Executive Vice President & Chief Operating Officer of FedEx Express who welcomed the Committee and highlighted the collaboration between FedEx and the FAA in moving the industry forward with NextGen. This was illustrated by FedEx’s Dan Allen and Josh Kendrick who focused on how the NextGen capabilities have improved efficiency, reduced fuel consumption emissions and expanded capacity during a presentation prior to the NAC meeting. This included a review of the 17% capacity gain, 3 min reduced taxi-out time, and 2.5 min reduced approach time through the implementation of Wake Recategorization (Wake ReCat) at Memphis International Airport.
The meeting officially began at 9:01 with all NAC members being asked to introduce themselves, and attendees from the general public were asked to sign the attendance sheet, (attendees are identified in Attachment 1 and the presentation used during the conduct of the meeting are contained in Attachment 2).

Designated Federal Official Statement

In his role as the DFO, The Honorable Michael Whitaker (FAA Deputy Administrator) read the Federal Advisory Committee Act notice, governing the public meeting.

Approval of June 5, 2015 Meeting Summary

Chairman Anderson asked for consideration of the written Summary of the June 5, 2015 meeting. By motion, the Committee approved the Summary (Attachment 3).

Chairman's Remarks

The following is a summary of the remarks made by Chairman Anderson (Attachment 4):

We are seeing tangible results from the deployment of some of the capabilities we identified as top priorities. It has been one year since approval by the NAC of the NextGen Integration Working Group (NIWG) final report and the NextGen Priorities Joint Implementation Plan that the FAA presented to Congress. Collectively we have achieved many successes in meeting implementation milestones for fielding NextGen capabilities. The plans must be kept up to date, working towards the goal of not just implementation, but improvements in operational performance. This included rolling out wake ReCat on an expedited manner.

While there are many interim programmatic and infrastructure milestones along the way for which all involved should receive due credit, until we move the needle on performance, we must remain diligent in our work together to see that all necessary components of each capability are achieved, such as training, decision support tools, procedures and policies.
From the start, there was a realization that there were stretch goals incorporated into the plan and many of these have been met or are on the path to completion. In other cases, for numerous reasons, milestones have been delayed. Understanding the root-cause, the NIWG Teams should now review the plans and modify as appropriate through the successful collaborative process. Through this transparent process, the Teams will review the program milestones and decide how to address issues.

Interdependencies of the capabilities, among not only the four priority areas, but also among how we integrate other capabilities in a way that makes the four priority areas more beneficial to the operation of the national airspace system, is crucial. Implementing capabilities in one alone, while helpful, doesn’t always lead to the bigger benefits we are all seeking.

It is encouraging that the FAA is including near-term flow management capabilities into the PBN focus area. Throughput is needed in a rational and metered way.

We must remain focused on throughput at airports – what we are doing is hard and we need to collaborate to be successful. Long term collaboration is the key to success.

The FAA is showing its continued confidence in the NAC and with the outstanding collaboration between the FAA and the NAC with the new Tasking on Metrics that builds on the six metrics and methods for tracking performance improvements approved by the NAC at the last meeting. The FAA and the industry are working together to collaboratively analyze and report performance on the specific implementations.

The NAC is a forum for the Industry and FAA to speak with one voice regarding the operational performance improvements attributable to NextGen implementation.

**FAA Report - Mike Whitaker, Deputy Administrator, FAA**

The following are the major points from Mr. Whitaker’s remarks. The details are contained in the FAA report (Attachment 5).

- The FAA is closely working with NASA on Low Visibility technology to achieve safety enhancements, and lowering the cost of maintaining the NAS.
NASA Representative- Dr. Jaiwon Shin has been added to the NAC to enhance this interagency effort.

- Jim Bowman, Senior Vice President, Flight Operations, FedEx Express has replaced Bob Gray, ABX Air as the NAC representative for the Cargo Airlines Association.
- The FAA has announced a new Compliance Philosophy:
  - US is the gold standard for safety
  - Shift to risk-based decision making
  - Undercurrent of the policy is cooperation and trust
  - FAA will continue to have a zero tolerance policy for safety violations
- The key principles of the FAA’s work with Congress on Reauthorization includes the need for stable funding for air traffic control operations and NextGen investments.
- New leaders have been announced for the FAA’s Unmanned Aircraft Systems (UAS) efforts: Gen. Marke “Hoot” Gibson is the Senior Advisor on UAS Integration and Earl Lawrence is the Director of the UAS Integration Office.
- The FAA has made progress on major NextGen infrastructure programs of ERAM and ADS-B. The Agency has had success with its key site Data Comm tests and has approvals for implementations in 2016.
- Teri Bristol, Chief Operating Officer, FAA Air Traffic Organization, explained the FAA’s response to an August ERAM software outage and steps being taken to prevent a reoccurrence. She also explained that the FAA had reached out directly to respond to questions raised during the June NAC meeting related to the FAA’s actions that ensure the integrity of the DataComm infrastructure from cyber-attacks.
- The FAA-Industry have made progress in the updating the NextGen Priorities plan, and the steps to jointly measure and analyze implementations.
- The NAC will be asked to provide recommendations to the FAA on plans to increasing their focus on Time Based Flow Management in the near-term, to optimize PBN, and in the long-term for PBN strategy.
- There are growing environmental challenges with PBN, which illustrates the importance of early engagement with airport communities. This was raised during NAC’s discussion of both the near-term implementations, and longer-term strategic work on PBN. Early and relentless
community outreach and collaboration has been, and continues to be, a major requirement in fielding PBN procedures.

Upon completion of the FAA report, Committee members engaged in discussion.

Chairman Anderson applauded the FAA on its statement of recent announcements on safety, and encouraged the Agency to make a similar commitment for NextGen.

On the issue of UAS, a NAC Member echoed statements that he made at a recent Congressional hearing on UAS and the need for the FAA to do something to prepare for the large numbers of UAS operations. The concern is the FAA and industry risk falling behind, and safety is an overarching concern in this new and emerging technology and aviation user. Another Member commented that many existing UAS operators who conduct operations in a professional manner recognize that technology development is underway to make UAS safer and for a safe integration into the National Airspace System (NAS).

Several committee members agreed with Mr. Whitaker’s point about the growing need to engage communities earlier in the PBN process with a determination to better address their interests. It was also suggested that the NAC or a subgroup of the NAC assist the FAA with a process to discern the impact on communities. Another Member noted that the use of future technologies and implementing NextGen is important and interest in noise is growing, underscoring the need to engage communities earlier. It was also recognized that arrivals do not generate as strong a response, but that each airport has unique demographics and there is a need to demonstrate trust to the community that what was predicted to occur does, in fact, occur.

In response to questions about what the NAC can do, a Committee Member emphasized the need for interaction with communities to avoid surprises in implementation. Another commented that airports, FAA, and aircraft operators are all in this together.

An FAA representative explained that it is a complicated issue and the Agency is trying to get out in front with outreach for Metroplex implementations. This includes participating in airport roundtables, increasing opportunities to engage with the communities about implementation and find a balance between community concerns and industry’s needs. This prompted a NAC Member to state that while dramatic progress has been made on overall noise reduction, dialogue is critical as PBN is implemented.
At the end of the discussion, the NAC agreed to the following:

**Committee Action:** Building on the landmark “Blueprint for Success to Implementing PBN” *October 2014*, the Committee has requested the PBN Blueprint Task Group help address community outreach in the implementation of PBN.

**NextGen Integration Working Group (NIWG) - Priority Area Reports**

The Committee received reports from the joint FAA-Industry NIWG on progress implementing the four priority areas of NextGen capabilities. The goal of the NIWG is to ensure the delivery of measurable benefits by dates certain, and thereby, increase the community’s confidence in NextGen.

Mr. Ed Bolton and Ms. Teri Bristol, FAA, explained that the collaborative effort reached the one-year mark since the NIWG final report was transmitted to the FAA, and the NextGen Priorities Joint Implementation Plan was presented to Congress, tackling the challenges inherent in the deployment of DataComm, Improved Multiple Runway Operations (IMRO), Performance-Based Navigation (PBN) and Improved Surface Operations capabilities.

Their comments reviewed the lessons learned and the vitality and energy of the FAA and industry in executing the implementations. They also emphasized how the FAA and industry have collectively achieved many successes in meeting implementation milestones for fielding NextGen capabilities and expressed agreement to roll the plan forward through 2019.

The NAC was presented with nine revisions to the 2014 plan:
The purpose of the revisions is to reflect the flexibility of the plan as the needs of the NAS and its users change. During discussions, the need for industry involvement in the planning was emphasized. The Committee endorsed updates to the 2015 plan, based on the slides presented during the meeting. These plans will be briefed to Congress by the FAA prior to the end of the year.

The Committee discussed initiating a rolling three-year implementation plan that will include a review of existing capabilities and locations in 2017 and the addition of new commitments within the four focus areas through 2019. The NIWG will report back to the Committee with an interim report at the February 2016 meeting, a final report at the June 2016 meeting, and publish the new plan in October 2016.

<table>
<thead>
<tr>
<th>Focus Area</th>
<th>#</th>
<th>Implementation/*Pre-implementation Commitment</th>
<th>Original Date</th>
<th>Change</th>
<th>Rationale</th>
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<tbody>
<tr>
<td>Data Comm</td>
<td>1</td>
<td>PID for En Route Services*</td>
<td>Q4 CY14 originally for 1 PID</td>
<td>Added - Q4 2015 (Feb. 2015 NAC)</td>
<td>Split Final Investment Decisions for Initial and Final En-route services due to budget constraints.</td>
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<tr>
<td>Surface</td>
<td>2</td>
<td>AEF5 – Newark</td>
<td>Assessment Complete Q4 CY14</td>
<td>Added - Q2 2016 (June 2015 NAC)</td>
<td>Feasibility assessment of electronic flight data for New York AEF5 resulted in a new implementation milestone for an additional AEF5 site at Newark Tower.</td>
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<td></td>
<td>4</td>
<td>Surface Data via ASC</td>
<td>CLE = Q3 CY15 CVG, PIT, MCI = Q3 CY16; PDX, MSY = Q4 CY16; ANC, ADW = Q1 CY17</td>
<td>Remove (except SFO complete Q3 2014) (June 2015 NAC)</td>
<td>Data will not be available. At ASSC locations, safety analysis identified the need for changes to ensure controllers have a complete picture of the surface, program changes underway.</td>
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<tr>
<td></td>
<td>5</td>
<td>Industry to provide 11 Data Elements</td>
<td>Q4 CY15</td>
<td>Revise – Industry working to provide New Date</td>
<td>Industry re-plan to align with data availability and program plans.</td>
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<tr>
<td>MRO</td>
<td>6</td>
<td>BOS - 7110.30B and Dependent Parallel Operations (DPO)</td>
<td>.30B = Q3 CY15 DPO = Q2 CY17</td>
<td>Add Pre-implementation Commitment Q1 CY2016</td>
<td>Commitment is dependent on RNAV/GPS approach to RWY 4L implementation. Change milestone to pre-implementation commitment. Assessment to implement 7110.30B and Dependent Parallel Operations (2500’ – 3600’).</td>
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<tr>
<td></td>
<td>7</td>
<td>ORO - Independent Parallel Operations (Dual w/Offset &amp; Triple)</td>
<td>N/A</td>
<td>Add - ORD - Q4 CY2015</td>
<td>New procedures being implemented when new runway opens October 2015.</td>
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<tr>
<td></td>
<td>8</td>
<td>Wake Recategorization</td>
<td>SFO - Q3 CY15</td>
<td>Merge Wake ReCat Implementation Commitments Revise SFO – Q2 CY16 Add Pre-implementation Commitment Q1 CY2016</td>
<td>Simplify tracking of Wake Recat commitments Add pre-implementation commitment: assessment of future Wake Recategorization capabilities</td>
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<tr>
<td>PBN</td>
<td>9</td>
<td>Metroplex – LAS Study Team Completion*</td>
<td>Assessment Complete Q4 CY14</td>
<td>Add – Q1 2016 (Feb 2015 NAC)</td>
<td>As the result of a positive Single Site Assessment of Las Vegas Basin pre-implementation commitment</td>
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Committee Action:

1. The NAC approved the 2015 plan revisions that will be forwarded to Congress.
2. The NAC agreed that the NIWG, through the NACSC, will report back to the Committee with an interim report at the February 2016 meeting. This includes a review of 2017 plans, and inclusion of 2018 and 2019 plans.

NIWG Focus Area Reports

The Industry Leads and the FAA Subject Matter Experts (SMEs) for each of the four focus areas presented reports on the existing commitments.

DataComm

- FAA SMEs: Jessie Wijntjes (ATO), Paul Fontaine (NG)
- Industry Leads: Dan Allen (FedEx Express), John O’Sullivan (Harris Corporation)

Mr. Wijntjes discussed the FAA program for Surface Data Comm pre-departure clearances and En route Controller-Pilot Data Link Communications (CPDLC). He explained that the Final Investment Decision (FID) for En route is under development. The FAA is accelerating implementations for pre-departure clearance locations to meet 2016 challenge dates.

Mr. Allen pointed out that the collaboration has been good between the FAA and industry. In response to a question from a NAC member about the timing for the system to be fully operational, Mr. Wijntjes explained that the three-year roll-out will be complete in 2019 because the FAA has accelerated ground-based technology, but now there is a need for a higher level of equipped aircraft.

Committee Members commented that equipage and training constraints for operators need to be addressed along with the business case. It was noted by Mr. Whitaker that incentives for equipage being employed in the Data Comm program are preferred to mandates, and operators have weighed-in on the capabilities that have driven decisions for the program.

Multiple Runway Operations

- FAA SMEs: Tom Skiles (ATO), Paul Strande (NG)
Industry Leads: Glenn Morse (United Air Lines), Jon Tree (The Boeing Company)

The briefing highlighted the implementation of Wake Recategorization (Wake ReCat). Chairman Anderson, along with several committee members encouraged the FAA and the industry to continue to work to deliver benefits from Wake ReCat implementation and encouraged continued acceleration of the capability wherever possible. Operator representatives commented that there is a high degree of benefit from bringing the implementation timelines to the left, essentially minimal investment to receive important capacity benefits.

Mr. Tree recognized the efforts of retiring FAA senior manager, Tom Skiles, and his work in the Wake ReCat effort.

Performance-Based Navigation (PBN)

- FAA SMEs: Josh Gustin (ATO), Donna Creasap (NG)
- Industry Leads: Gary Beck (Alaska Airlines), Steve Fulton (Sandel Avionics)

The Team reviewed the status of the following commitments:

- Complete Established on RNP (EoR) Special Authorization for Widely Spaced Operations at Denver (2015) – the waiver has significantly increased utilization
- Develop a National Standard for EoR Widely Spaced Operations (2017)
- Complete an EoR RNP Track-to-Fix Safety Assessment (2015)
- Complete 3 additional Metroplex sites: Northern California (2015), Charlotte (2017), and Atlanta (2017)
- Complete a Las Vegas Basin Assessment (2014) – FAA is moving forward with the Metroplex initiative. The study team will be in place to give a report by the end of the calendar year.

Mr. Fulton explained that as he has flown in northern California, there are improvements in north-south operations on the west coast, continuous descent arrivals, and simplified flight procedures making it easier for pilots and controllers. Mr. Beck noted collaboration was essential for the EOR TF and AR support for inclusion in NIWG, and that this represented a balance among operators and a willingness of the FAA to support both procedures.
Though not a specific NIWG commitment, the industry team leads commented that operators in Seattle, WA have also experienced savings in fuel consumption and emissions since EOR AR procedures were implemented in April. In addition, the procedures were important to minimize the capacity effects from a runway closure.

An operator member of the Committee made the point that an important success story of PBN implementation has occurred at JFK. It was enabled by close partnership between the FAA, NATCA and industry, and increased throughput for the airport during time of runway closure making commitment for PBN implementation even though a runway was closed.

Surface

- FAA SMEs: Robert Varcadipane (ATO) and Nick Lento (NG)
- Industry Leads: Rob Goldman (Delta Air Lines), Steve Vail (Mosaic ATM, Inc.)

The SMEs and Team Leads reviewed the status of the implementations and pre-implementation activities that includes airport participation in Collaborative Decision Making (CDM) and access to surface data (SWIM); Airport Surface Departure Metering; Advanced Electronic Flight Strips (AEFS); and utilizing Earliest Off Block Time (EOBT) for short range flights.

The briefing included updates on the on-going work of the NASA–FAA departure metering project in Charlotte and the industry’s identification of the data elements necessary to support departure Metering and the EOBT initiative. The industry will present a revised milestone prior to the end of the year.

Team Lead Steve Vail emphasized the need for the FAA to review its various surface FAA-Industry collaborative efforts to avoid duplication and maximize the effectiveness of the cooperative work.

**Metrics: Measuring Effects of Implementations**

Mr. Bolton and Mr. Joe Post, FAA, reviewed the FAA’s plans for moving forward with the Metrics tasking, following the last NAC meeting when the Committee approved six metrics to evaluate the NextGen implementations at selected sites. NAC Subcommittee Co-Chairs, Mr. Tim Campbell, American Airlines, and Ms. Melissa Rudinger, AOPA, also participated in the discussion.
The vehicle for accomplishing the FAA-Industry work is the Joint Analysis Team (JAT). The JAT supports the goal of evaluating the performance improvements attributable to the implementation of selected capabilities at specific locations.

Ms. Margaret Jenny, RTCA, explained the industry response to the FAA including the names of the industry representatives for the JAT that will be conducting the work. This includes quantitative assessments and outreach to FAA and industry Subject Matter Experts with operational expertise on the specific implementations.

She introduced the representatives from Passur Aerospace, an independent vendor selected by RTCA to provide a dashboard and associated analytic capability, who then presented their capabilities to the NAC. Jim Barry and Ron Dunsky, Passer Aerospace, provided an overview of the work they have been contracted to perform related to supporting the JAT and working collaboratively with the industry and the FAA.

Ms. Jenny explained that the industry’s analytic capability, along with that from the FAA, will be used collectively to evaluate the implementations, promote success and identify and address any obstacles to success, as requested by the FAA’s tasking. Chairman Anderson and other representatives from the industry emphasized that trust is essential—the industry and the FAA must speak with one voice regarding the operational performance improvements attributable to NextGen implementation. Each member of the NAC, and subordinate groups, is committed to adhering to stringent guidelines for the use of the RTCA/PASSUR industry analytic capability and its output.

The Committee requested that the benefits received by the aviation industry from NextGen implementations be promoted. Two specific examples cited were JFK PBN and Memphis Wake ReCat implementations. The NAC Subcommittee will take the initiative to follow-up on this action.

It was noted during the discussion that the metrics will also support the NIWG work on developing a rolling plan.

Other Committee members noted that data is needed to tell the story of how implementations have provided benefits and it is critical that the FAA and industry communicate and work together on this effort.
In response to a Committee members question about business aviation, it was noted that implementations are important to all operators and the evaluations must incorporate the impacts of various aspects of the industry.

In conclusion, Mr. Campbell expressed appreciation to the FAA for agreeing to work with the industry, and the NAC will receive an update on the actions at the next meeting.

**FAA NextGen Promotional Effort**

Ms. Pamela Whitley, Assistant Administrator for NextGen, presented the FAA’s plans for featuring an FAA NextGen Promotional Program at the upcoming Air Traffic Control Association industry event.

**NAC ADS-B Ad Hoc Group Report**

Mr. John Hickey, Mr. Bruce Decleene and Mr. Jim Linney, FAA, outlined the current state of ADS-B equipage, the Equip 2020 effort for operator equipage with ADS-B out, and future plans for the FAA’s infrastructure necessary to support the implementation with ADS-B In. Discussion ensued on the low equipage numbers, both for air carriers and general aviation. It was noted that commercial operators are developing plans for equipage and it is imperative that operators not wait until the last minute to meet the deadline. The Committee agreed that carriers should report on the status of plans for output of 2020 fleet equipage of ADS-B via the Equip 2020 activity, and the FAA report on fleet progress at future NAC meetings.

A Committee Member also pointed out that the repair facility capacity for installing the equipment is an important part of the compliance process. A question was raised about the status of the document needed to identify integrated solutions. In response to comments from the Committee, Mr. Hickey emphasized that the FAA certification offices will not be an impediment for obtaining approvals needed for ADS-B equipment installations.

One NAC Member stated that the privacy issue is still unresolved and work is underway on possible solutions at the Equip 2020 meeting in December. This continues to be an outstanding issue from the ADS-B Task Group recommendation approved by the NAC.

**Performance Based Navigation (PBN) National Airspace System Navigation Strategy**
Mr. Mark Bradley, Delta Air Lines, and Chairman of the PBN Aviation Rulemaking Committee (PARC), provided an out-brief about the work underway to develop revisions to the FAA 2006 PBN National Airspace System Navigation Strategy that outlines a plan to transition to a PBN NAS over the next 15 years. The PARC has been coordinating closely with the NACSC to receive important industry input. As a result, the NAC will be officially tasked to develop recommendations related to traffic flow management automation and decision support tools, a key enabler for successful PBN deployment.

NextGen Plan

Mr. Paul Fontaine, FAA NextGen Office, provided a briefing of the integrated FAA plan for NextGen. Committee members recommended adding the challenge of funding investments and emphasizing the value proposition of NextGen investments. FAA officials explained the difficulties if Congressional funding is reduced from the requested amounts and the impacts that this would have on the timing of implementations.

Committee members also identified the value of relevant metrics to evaluate implementations and assist the FAA in maximizing NextGen investments. Committee members discussed the relevance of knowing when implementations are successful, having achieved the intended goals.

Summary of the Meeting and Next Steps

The NAC Secretary summarized the following actions from the meeting and follow-up items (contained in a table below):

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Responsible Entity</th>
<th>Completion Date</th>
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<tbody>
<tr>
<td>Determine how the NAC/NACSC can address community outreach in the</td>
<td>FAA/RTCA</td>
<td>TBD based on FAA and airports review of current actions at November 2015 NACSC</td>
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<tr>
<td>implementation of PBN (community impacts)</td>
<td></td>
<td>meeting</td>
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<tr>
<td>NAC accepted October updates to NextGen priorities. Updates will be</td>
<td>NIWG Leadership (FAA/Industry)</td>
<td>November 2015</td>
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<td>incorporated into the plan and Congress will be briefed.</td>
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<tr>
<td>NextGen Integration Working Group will initiate developing a rolling plan</td>
<td>NIWG Leadership (FAA/Industry)</td>
<td>Kick-Off Nov NACSC meeting</td>
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<td>Interim February NAC meeting</td>
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<td>Final June NAC meeting</td>
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Carriers report on status of plans for output of 2020 fleets equipage of ADS-B (Note: releasable data should be de-identified) | Industry: provides data via Equip 2020; Reports fleet progress at NAC meeting | December Equip 2020 Meeting Update: February NAC 2016 meeting

Report on ADS-B equipage status for air carrier and general aviation at future NAC meetings | FAA | 2016 NAC Meetings February/June/October

Pending FAA tasking related to traffic flow management, as a result of PBN Aviation Rulemaking Committee’s work on PBN NAS Navigation Strategy | FAA/PARC | November 2015 Presentation of Tasking to NACSC; Due Date for Tasking, TBD

NAC should promote benefits received by the aviation industry from NextGen implementations, specifically JFK PBN implementation and Memphis Wake ReCat | NAC/NACSC | November 2015 NACSC meeting Agenda Item to determine follow-up activities

DFO Closing Comments
Mr. Whitaker thanked the members for their participation in the meeting, and the continued work on the NIWG priorities and metrics.

Chairman Closing Comments
Mr. Anderson emphasized the need for continuing to tell the story of NextGen implementations citing the FedEx experience at Memphis and JFK PBN implementation as examples. This will foster a better understanding of the benefits and the return on investments from NextGen.

Other Business
RTCA President Margaret Jenny presented Committee Member Jim Bowman with a plaque, recognizing him for his previous work as Co-Chair of the RTCA Tactical Operations Committee (TOC). The TOC is addressing the implementation elements of many NAC recommendations.

Adjourn
By motion, Chairman Anderson concluded the meeting of the Committee at 2:55 p.m.

Next Meeting
The next meeting of the NAC is February 25, 2016 in Atlanta, GA, hosted by Delta Air Lines.
## Attendees:
### October 8, 2015 Meeting of the NextGen Advisory Committee
Memphis, TN

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
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<tbody>
<tr>
<td>Allen, Bill</td>
<td>JetBlue Airways</td>
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<td>Allen, Dan</td>
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<td>Anderson, Richard</td>
<td>Delta Air Lines, Inc.</td>
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<td>Bailey, Michael</td>
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<td>Aircraft Owners and Pilots Association</td>
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<td>Basso, Philip</td>
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Welcome to the Meeting of the NextGen Advisory Committee

October 8, 2015
FedEx Express Headquarters

Welcome to FedEx Express

David Cunningham, Chief Operating Officer
Welcome & Introductions

Richard Anderson, NAC Chairman

PUBLIC MEETING ANNOUNCEMENT
Read by: Designated Federal Official Michael Whitaker
NextGen Advisory Committee
October 8, 2015

In accordance with the Federal Advisory Committee Act, this Advisory Committee meeting is OPEN TO THE PUBLIC.

Notice of the meeting was published in the Federal Register on:

September 9, 2015

Members of the public may address the committee with PRIOR APPROVAL of the Chairman. This should be arranged in advance.

Only appointed members of the Advisory Committee may vote on any matter brought to a vote by the Chairman.

The public may present written material to the Advisory Committee at any time.
Review and Approval of:

June 5, 2015
Meeting Summary

Chairman’s Report
Richard Anderson, NAC Chair
NAC Agenda Topics

- NextGen Integration Working Group Reports
  - DataComm
  - Multiple Runway Operations
  - PBN
  - Surface

- Metrics: Measuring Effects of Implementation
  - Overview of Reporting Process
  - FAA Actions on Performance Reporting
  - Industry Performance Tracking – vendor presentation
NAC Agenda Topics (cont’d)

- ADS-B
  - Status of implementation
  - Spaced based surveillance, oceanic surveillance, common weather picture

- Performance Based Navigation (PBN) National Airspace System Navigation Strategy

- NextGen Plan

DISCUSSION
NextGen Integration Working Group (NIWG) Reports & Discussion
**NextGen Priorities Lessons Learned**

**Interviews**

The following individuals participated in a 30-60 minute face to face or telephone interview:

<table>
<thead>
<tr>
<th>NAC</th>
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<tr>
<td>Bill Ayer, Senior Leader</td>
<td>Mike Whitaker, Senior Leader</td>
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<td>Margaret Jenny, Senior Leader</td>
<td>Teri Bristol, Senior Leader</td>
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<td>Steve Dickson, Senior Leader</td>
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<td>Gary Beck, Team Lead PBN</td>
<td>Rich Swayze, Senior Leader</td>
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<td>Rob Goldman, Team Lead Surface</td>
<td>Bruce DeCleene, Senior Leader</td>
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<td>Dan Allen, Team Lead Data Comm</td>
<td>Pam Whitley, Senior Leader</td>
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<td>Glenn Morse, Team Lead MRO</td>
<td>Tom Skiles, SME Lead MRO</td>
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<td>Paul Rinaldi, NATCA</td>
<td>Paul Strande, SME Lead MRO</td>
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<td>Mel Davis, NATCA</td>
<td>Jesse Wijntjes, SME Lead Data Comm</td>
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<td>Ed Bolen, NAC Member</td>
<td>Josh Gustin, SME Lead PBN</td>
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<td>Peter Challan, NAC Member</td>
<td>Donna Creasap, SME Lead PBN</td>
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<td>Lee Moak, Former NAC Member</td>
<td>Paul Fontaine, SME Lead Data Comm</td>
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*Interviews were conducted by Pamela Gomez (FAA)/Andy Cebula (RTCA)/Sarah Fish (FAA)/Cathy Kern (FAA)*
Scope of Lessons Learned

- **Summer 2013**: FAA tasked industry to establish a set of priorities
- **Fall 2013**: NAC developed: **High Benefit + High Readiness**
  - High Readiness: Determined from FAA’s NSIP Lite
- **Spring 2014**: 4 Priorities Areas determined and Congressional Tasking ensued
- **Spring – Fall 2014**: NextGen Integration Working Group (NIWG) initiated. FAA and the NAC worked together to develop a joint implementation plan for industry priority capabilities
- **Fall 2014**: Implementation Monitoring/Oversight

Summary of Findings

**Trust**
- Increased trust between FAA and industry
- Hill buy-in
- Seeing tangible benefits
- Accountability for all

**Confidence**
- Infused new energy into NextGen program
- Success is building confidence, increasing industry advocacy and credibility
- Proved FAA can deliver and implement NextGen

**Together**
- A new appreciation on both sides
- Unifying effort that built consensus
- Proved we can plan and execute together
- The new standard for doing business
Focus Area Completions to Date 3rd Quarter CY2015 (unless otherwise noted) 4th Quarter CY2015

MRO
- Wake Recat ATL, CVG
- Wake Recat IAH, HOU
- Wake Recat JFK, EWR, LGA
- Wake Recat CLT
- Dual Independent Parallel Ops ATL
- Safety Analysis WTMA-P PHL, DTW
- Safety Analysis WTMA-P ATL
- Safety Analysis 7110.308 SFO
- Wake Recat ORO, MDW
- FID for WTMD
- Safety Analysis WTMA-P PHL, DTW
- Wake Recat JFK, EWR, LGA
- Wake Recat, CLT
- Wake Recat SFO
- 7110.308 BOS
- FID for WTMD

PBN
- Single Site Assessment – Las Vegas
- EoR Widely Spaced Operations DEN
- Northern California Metroplex
- ELSO National Standard
- Wake Recat ATL, CVG
- Wake Recat IAH, HOU
- Wake Recat JFK, EWR, LGA
- Wake Recat CLT
- Dual Independent Parallel Ops ATL
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- Wake Recat, CLT
- Wake Recat SFO
- 7110.308 BOS
- FID for WTMD

Surface
- Surface Surveillance Event Data SFO
- TFMS Data Sharing via SWIM
- Feasibility Assessment AFSF NY
- Feasibility Assessment TFDM Program
- Departure Management
- AFSF CLE ATCT
- SWIM S/V T Deployment 5 TRACONS
- TBFM Wheels Up Procedural Change (i)
- Airport Operations as CDM Participants (i)
- Simplify Application for SWIM Data (i)
- EoR Widely Spaced Operations DEN
- Northern California Metroplex
- EoR Track to Fix Safety Analysis
- Industry to Provide 11 Data Elements (i)

Data Comm
- FID for "Initial" En Route Services
- Recommendations for Recorder Rule for Retrofit (i)
- Departure Clearance Tower Services SLC
- Departure Clearance Tower Services IAH
- Departure Clearance Tower Services HOU
- Departure Clearance Tower Services SLC
- Departure Clearance Tower Services IAH
- Departure Clearance Tower Services HOU
- Assessment of Boeing 727 Flight Management Computer Issue (i)
- FID for En Route Services – Full Services

FAA TOTALS (Score Card)
- 29 commitments
- Bold = Completed Recently; (i) = Industry
- On track
- Complete
- Delayed
- Build on existing focus areas to make them more effective/useful
- Include follow on commitments from assessments
- Include more Industry commitments
- Add year by year
- Address next 3 years (encompass 2020 Mandate)
- 24-36 months is key for field
- Rolling three year window updated every 6 mos.
- Be clear about budget constraints
- Model the performance contributions (metrics) to inform ranking of priorities
- Be agile and nimble to make legitimate adjustments to priorities where warranted and justified

100% Agreement on Need for Rolling Plan

- Build on existing focus areas to make them more effective/useful
- Include follow on commitments from assessments
- Include more Industry commitments
- Add year by year
- Address next 3 years (encompass 2020 Mandate)
- 24-36 months is key for field
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- Be clear about budget constraints
- Model the performance contributions (metrics) to inform ranking of priorities
- Be agile and nimble to make legitimate adjustments to priorities where warranted and justified
Conclusions

• As a result of what we heard, NIWG leadership has agreed to:
  • First, update the plan to reflect current reality
  • Second, in November, launch an effort to roll the plan forward
  • Developing action plan to streamline NIWG process and incorporate lessons learned into rolling plan
Data Comm Team

Industry Leads:
Dan Allen (FedEx Express)
John O’Sullivan (Harris Corporation)

FAA SMEs:
Jessie Wijntjes (ATO)
Paul Fontaine (NG)

Data Communications (Data Comm)
Provides data comm services between pilots and air traffic controllers as well as enhanced air traffic control information to airline operations centers

FAA Commitments
- Final Investment Decision (FID) for Initial En Route Services to all 20 CONUS Air Route Traffic Control Centers (2014)
- Full Services FID deferred to Q4 CY2015
- Extend Departure Clearance Operations Trials at Memphis and Newark through January 2016
- Departure Clearance (DCL) Tower services to 56 airports (2015-16) – Challenge Dates
  - Baseline dates are 2016-2019
Benefits of Data Comm

**Reduce communication time between controllers & pilots**

**Improve re-routing around weather and congestion**

**Increase flexibility and accommodation of user requests**

**Enable NextGen Initiatives & Trajectory-Based Operations**

### Throughput/Efficiency
- Delay
- Fuel Burn

### Controller/Pilot Efficiency
- Communication Time
- Controller Workload

### Environmental
- Emissions (CO₂)

### Safety
- Read/hear back errors
- Loss of Comm events

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**Program Services Roadmap**

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**Controller-Pilot Data Link (CPDLC) Departure Clearances (DCL)**

**Initial En Route Services**
- Transfer of Communications
- Initial Check-In
- Altimeter Settings
- Altitudes
- Speeds (Limited)
- Crossing Restrictions (Limited)
- Airborne Reroutes / Go Button
- Controller Initiated Reroutes (Limited)
- Direct-to-Fix (Limited)

**Full En Route Services**
- Controller Initiated Routes (Full)
- Direct-to-Fix (Full)
- Crossing Restrictions (Full)
- Advisory Messages
- Holding Instructions
- Speeds (Full)
- Stuck Microphone
- Tailored Arrivals
- Beacon Codes

**Future Air Navigation System (FANS)**

**Aeronautical Telecommunications Network (ATN)**

**4D Trajectories**
- Dynamic RNP
- Adv Fit Int Mgt with ATC winds

**IOC**
- To be Baselined Q4 CY2015
- Baseline May 2012
- Baseline October 2014
Data Comm Status – Recent Accomplishments

  - Additional Tower Data Link Services and En Route Automation Modernization releases planned to support the implementation waterfall

- Delivered Enhanced Pre-Departure Clearance service at Boise – June 2015

- Achieved Initial Operating Capability for all three Key Sites – met challenge dates eight months ahead of baseline
  - Salt Lake City – Aug 2015
  - Houston Intercontinental – Sep 2015
  - Houston Hobby – Sep 2015

Waterfall reflects challenge schedule dates (calendar year)
- Baseline schedule Tower deployment dates are 2016-2019
- Substituted Portland (PDX) for Cincinnati (CVG) due to projected operations at those locations
- Will deploy En Route Services to all 20 Air Route Traffic Control Centers (ARTCC) starting in 2019
Data Comm Progress

• Tower Data Link Services
  – Completed TDLS hardware and software modifications to support key site IOCs
  – Enhanced Computer Human Interface needed for implementation waterfall to be completed in December 2015
  – Additional releases planned to support follow-on key site operations and the implementation waterfall

• En Route Automation Modernization
  – Completed ERAM installation and integration at Salt Lake City, Houston, and Atlanta Centers
  – Working with ERAM Program Office to package fixes as necessary to support Data Comm waterfall

• Data Communications Network Services – air-ground communications
  – Service volumes for Salt Lake City, Houston Intercontinental, and Houston Hobby key-sites are operational

• FAA Telecommunications Infrastructure – ground-ground communications
  – All required services have been ordered and cutover

• Continuing to coordinate training of controllers and technicians to support the waterfall

Data Comm En Route Services

• Received Final Investment Decision for Initial En Route Service in October 2014
  – S1P2 Full En Route Service FID planned for Q4 CY2015

• Developed En Route execution strategy
  – Initial Services use cases complete and coordinated with controller teams
    ➢ Computer Human Interface User Team and ERAM National User Team validated Initial Services CHI design
    ➢ Full Services use cases developed and in the process of being coordinated with the controller teams
  – Initial and Full Services deployment strategy briefed to external stakeholders
    ➢ Working planning details with industry through joint FAA-industry Data Comm Implementation Team

• Started development of ERAM software enhancements to support Data Comm Initial En Route Services
  – Initial En Route services on track to be delivered starting in CY2019
Data Communications Commitments
FAA

Data Comm Air Carrier Coordination

- Coordinating with air carriers to support test and deployment
  - Aircrew training
  - Interface testing with Airline Operation Centers dispatch automation systems
  - Scheduling aircraft to support testing in advance of IOC

- Working with the operators on activities necessary for Data Comm operations
  - Flight Data Recorder Rule policy clarification published
  - Released Ops Spec A056, “Data Link Communications”
    - Some Ops Specs approvals have already been granted to air carriers
Data Comm Air Carrier Participation

- Variety of operators using Data Comm at SLC, IAH, and HOU
  - FedEx Express
  - UPS
  - United Airlines
  - Southwest Airlines
  - US Air Force

- Industry working with FAA to support the waterfall

Data Comm Air Carrier Participation

- 1,319 Data Comm equipped aircraft operating in the NAS as of October 2 that includes FANS/VDL-2, FANS/POA, business jets, and international aircraft

- 524 aircraft have been equipped through the Data Comm equipage initiative
## DISCUSSION
Multiple Runway Operations Team

**FAA SMEs:**
Tom Skiles (ATO)
Paul Strande (NG)

**Industry Leads:**
Glenn Morse (United Air Lines)
Jon Tree (The Boeing Company)

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**MRO Accomplishments To Date**

- **Wake RECAT**
  - Operating at MEM, SDF, CVG, ATL, IAH/HOU, CLT, EWR/JFK/LGA/ISP/HPN/TEB, and ORD/MDW and delivering benefits

- **Simultaneous independent procedures**
  - Authorized new standards for independent triple approaches and independent approaches using offsets (Notice JO 7110.693)
  - These procedures will be implemented at ORD with their new runway
  - Implementation at additional sites will be completed prior to the original CY17 commitments

- **Dependent procedures**
  - Authorized reduced separation standards for dependent approaches (1 NM) for CSPRs with runway centerlines spaced between 2500’ and 3600’ (Notice JO 7110.693)
  - This will be implemented prior to Q2 CY16 commitment date

- **Pre-implementation analyses for WTMD, WTMA-P, and 7110.308 are all complete**
  - Follow-on plans are in development
DISCUSSION

PBN Team

FAA SMEs:
- Josh Gustin (ATO)
- Donna Creasap (NG)

Industry Leads:
- Gary Beck (Alaska Airlines)
- Steve Fulton (Sandel Avionics)
## Northern California Phased Implementation

44 procedures implemented over four chart cycles

- **Oakland ARTCC (ZOA)** - 8 Q Routes
- **San Francisco** - 10 RNAV SIDS, 5 RNAV STARS
- **Sacramento Int’l** - 3 RNAV SIDS, 3 RNAV STARS
- **Oakland Int’l** - 3 RNAV SIDS, 4 RNAV STARS
- **San Jose Int’l** - 4 RNAV SIDs, 4 RNAV STARS

### Chart Date

- **Sept 2014** - Full Publication (7 STARs)
- **Nov 2014** - Phased Publication (6 SIDs, 1 STAR, 8 Q-Routes)
- **Jan 2015** - Phased Publication (9 SIDs)
- **Mar 2015** - Phased Publication (5 SIDs, 8 STARS)
- **Apr 2015** - Full Publication (7 STARS)
Atlanta, and Charlotte Status

• Atlanta Metroplex
  • The Implementation Phase began April 1, 2015
    • The Implementation Plan and Training Plan are complete
    • Publication dates are planned for February 4, 2016, July 21, 2016, and September 15, 2016

• Charlotte Metroplex
  • The Implementation Phase began April 20, 2015
  • Planning five publication dates from August 20, 2015 through January 5, 2017
    • August 20th procedures (2 RNAV STARs and 5 RNAV SIDs) were published and will be implemented with the October 15, 2015 RNAV SID
    • Implementation planning is on track
  • The next pub cycle will be May 26, 2016 (1 RNAV STAR and 3 RNAV SIDs)
EoR Status

- Develop EoR Widely Spaced (WS) Ops National Standard – by Q2 CY17: On Track
  - Concept Validation Activities – Ongoing
    - Continuing with plans to utilize concept validation results at Denver to inform National standard change
      - Planning second phase of Denver on-site “live” EoR observations – Week of October 19, 2015
      - Concept Validation Report – Final Due Feb 2016
  - Integrated Plan for National Standard Change with ANG/AJV – Ongoing
    - DCP Internal Headquarters Approval – Completed August 26, 2015
    - External DCP Review - Completed / Pending Comment Adjudication

EoR Status (cont.)

- Complete EoR Track-to-Fix (TF) fly-by Approach Safety Analysis – by Q4 CY15: On Track
  - Continue TF Sensitivity Analysis – Ongoing
    - To be completed following Human-in-the-Loop (HITL) Data Collection Efforts (DCEs)
  - Continue Risk Analysis using HITL Distributions – Ongoing
  - Final Safety Technical Report – On Track: Q4 CY15
    - On August 14th, the Established on RNP (EoR) team held an External Stakeholder Focus Group Meeting
    - The meeting was well-attended by over 35 representatives from FAA, NATCA, and industry stakeholders (American Airlines, Southwest Airlines, Frontier Airlines, Delta Airlines, Alaskan Airlines, United Airlines)
    - Topics included: methodology and progress of the Duals Track-to-Fix (TF) Safety and Analysis, collision risk model, HITL general observations and acknowledgement among all stakeholders that significant reduction in un-stabilized approaches is both a safety and passenger comfort benefit
NorCal Airspace/Procedures

- “Incremental” Implementation of 40 total Procedures Nov ’14 to Apr ’15 (four cycles)
  - RNAV/PBN/RNP procedures—40
    - 14 STARs
    - 18 SIDs
    - Q-Routes—8
- November 13, 2014—1 RNAV STAR, 6 RNAV SIDs, and 8 Q-Route
  - San Francisco Int’l (KSFO)
    - CIITY 1 RNAV SID
    - FOGGG 1 RNAV SID
    - NIITE 1 RNAV SID
    - SNTNA 1 RNAV SID
    - TRUKN 1 RNAV SID
  - Sacramento Int’l (KSMF)
    - SLMMR 1 RNAV STAR
  - Oakland Int’l (KOAK)
    - HUSSH 1 RNAV SID
  - Oakland ARTCC (ZOA)
    - Q 120 ORRCA CA TO UFFDA MN AMDT Y
    - Q 128 SYRAH CA TO JILLS AL AMDT Y
    - Q 130 SYRAH CA TO PANHANDLE (PNH) VORTAC TX AMDT Y
    - Q 158 NTELL CA TO JEDNA NV ORIG
    - Q 160 SHVVR CA TO BIKKR CA ORIG
    - Q 162 NTELL CA TO MYCAL NV ORIG
    - Q 164 NTELL CA TO ROCCY UT ORIG
    - Q 166 VIKSN CA TO BIKKR CA ORIG
NorCal Airspace/Procedures

**January 8, 2015—9 RNAV SIDs**
- Sacramento Int’l (KSMF)
  - FTHIL 1 RNAV SID
  - RVRCT 1 RNAV SID
  - SCTWN 1 RNAV SID
- San Francisco Int’l (KSFO)
  - SAHEY 1 (RNAV SID)
  - SSTIK1 (RNAV SID)
  - WESLA 1 (RNAV SID)
- San Jose Int’l (KSJC)
  - TECKY 1 (RNAV SID)
- Oakland Int’l (KOAK)
  - CNDL1 (RNAV SID)
  - KATFH 1 (RNAV SID)

**March 5, 2015—8 RNAV STARS, 4 RNAV SIDs, and 1 Conv. SID**
- San Francisco Int’l (KSFO)
  - AFIVA 1 (RNAV SID)
  - GNRRR 1 (RNAV SID)
  - BDEGA 1 (RNAV STAR)
  - SERFR 1 (RNAV STAR)
  - STLER 1 (RNAV STAR)
- San Jose Int’l (KSJC)
  - ALMDN 1 (RNAV SID)
  - BMRNG 1 (RNAV SID)
  - BRIXX 1 (RNAV STAR)
  - FRLON 1 (RNAV STAR)
  - SILCN 1 (RNAV STAR)
  - LOUPE THREE SID
- Oakland Int’l (KOAK)
  - AANET 1 (RNAV STAR)
  - WNDSR 1 (RNAV STAR)
NorCal Airspace/Procedures

- April 30, 2015—5 RNAV STARs and 2 Up-Numbered RNAV STARs
  - San Francisco Int’l (KSFO)
    - DYAMD 1 (RNAV STAR)
    - YOSEM 3 (RNAV STAR)
  - San Jose Int’l (KSJC)
    - RAZBB 1 (RNAV STAR)
  - Oakland Int’l (KOAK)
    - EMZOH 1 (RNAV STAR)
    - OAKES 1 (RNAV STAR)
  - Sacramento Int’l (KSMF)
    - SUUUTR 1 (RNAV STAR)
    - SLMMR 2 (RNAV STAR)

DISCUSSION
Surface Team

**FAA SMEs:**
Robert Varcadipane (ATO)
Nick Lento (NG)

**Industry Leads:**
Rob Goldman (Delta Air Lines)
Steve Vail (Mosaic ATM, Inc.)

---

**Surface Operations**

**Implementation Commitments**

<table>
<thead>
<tr>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3</td>
<td>Q4</td>
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</tbody>
</table>

- Advanced Electronic Flight Strip (AEFS)
- FAA to ingest 11 Data Elements via TMIS Update
- Surface Surveillance Event Data Distribution to Users via SWMM (A-SCE XASNC)
- System Wide Information Management (SWIM)
- Surface Weather Tool (SW7)
- Deployment
- Traffic Flow Management System (TFMS)
- Time-Based Flow Management (TBFM) New Data Sharing via SWMM
- Surface Departure Management

*implimented, on track, new/modified, deleted*

*All dates are in calendar years.*
Surface Operations
Pre-Implementation Commitments

Surface Strategy

Data Exchange & Stakeholder participation is the foundation for Collaborative Decision Making (CDM)

CDM is the proven gold standard for Traffic Flow Management (TFM)

NIWG addresses the surface TFM gap by aligning its recommendations with CDM principals

CDM/TFM must evolve, while maintaining its core principals and capabilities
## Industry Surface Update

### 1. Improve SWIM on-ramping process
- Addresses connectivity issues with the NextGen “data bus”
  - Whitepaper distributed and CSG briefed
  - NAC-SC briefed
  - SWIM Connectivity / TFMDa toolkit briefed at FAA Industry Technical Forum

### 2. Establish airports as CDM Members
- Establishes data exchange with airports and allows airports to provide departure readiness for non-CDM members in support of departure metering
  - Surface CDM Team (SCT) completed tasking and briefed CSG
  - Subsequent work required to develop process and procedures and additional criteria

### 3. Preschedule Time Based Flow Management (TBFM) timeline for close-in flights
- Reduces taxi time (delay) and variance (unpredictability) for releasing flights into overhead stream
  - SCT completed tasking and briefed CSG
  - Provides both an automated and manual “boiler plate” process solution

### 4. Industry to provide 11 surface CDM data elements
- Facilities departure metering and the ability to deliver predictability into the NAS
  - Will recommend aligning date to TFMS Release 13 (date when FAA can receive data)
  - NIWG Surface Group to meet to confirm updated target
### Surface Operations: Industry Commitments

<table>
<thead>
<tr>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3</td>
<td>Q4</td>
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<td>Q2</td>
</tr>
<tr>
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<td>Q2</td>
</tr>
<tr>
<td>Q3</td>
<td>Q4</td>
<td>Q1</td>
<td>Q2</td>
</tr>
</tbody>
</table>

- **Airport Operations as Collaborative Decision Making (CCDM)** Participants
- Industry to provide 11 Data Elements
- Simplifying Application for System Wide Information Management (SWIM) Data
- Time Based Flow Management (TBFM) "Wheels Up" Procedure Change
- Using New "Earliest Off Block Time" Data Element

<table>
<thead>
<tr>
<th>Implemented</th>
<th>On Track</th>
<th>New/Expanded</th>
<th>Delayed</th>
</tr>
</thead>
</table>

All dates are in calendar years.

---

### DISCUSSION
Metrics: Measuring Effects of Implementations

Joint FAA/Industry Analysis Goal

To understand the operational impacts and performance changes following each NextGen implementation

- Estimate, compare, and evaluate relevant performance metrics before and after each implementation
  - NAC recommended metrics
  - Other metrics as appropriate
- Challenges:
  - Site-specific developments that also contributed to observed changes in performance
    - Construction projects, other operational changes, etc.
    - Changes in ongoing trends observed over longer time period
  - Controlling for and normalizing as needed to isolate the signal
    - Operating conditions, demand, time of day, flight characteristics, runway-used, direction of flight, etc.
Initial Capabilities and Locations

- RECAT at Charlotte
- North Cal Metroplex
- RECAT at Chicago (ORD & MDW)
- EoR at Denver

Joint Analysis Team Participation

- FAA
  - NextGen
  - Air Traffic Organization
  - Office of Policy and Plans
- Operators and Community
  - Representatives from NACSC-participating organizations, e.g.,
    - Airlines
    - Freight operators
    - General aviation
    - Airports
    - Labor
    - Manufacturers
- RTCA

Includes NIWG SME’s and local experts as required
Data Sources

• Industry Dashboard
• FAA public database (Aviation System Performance Metrics)*
• ASDI data
  - 15 year FAA archive
• Other FAA & MITRE surveillance data archives
  - PDARS
  - National Offload Program
  - MITRE Threaded Tracks*
  - ASDE archive
• Fuel burn data
  - A4A city-pair data*
  - Other airline data if available*

*Reported on FAA NextGen Performance Snapshots

• Backup Metrics
## Initial Metrics - Flight Efficiency

<table>
<thead>
<tr>
<th>Value</th>
<th>RECAT</th>
<th>Metrics</th>
<th>EFF</th>
<th>Metric</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>x*</td>
<td>x*</td>
<td>x*</td>
<td></td>
<td>Overall Flight Efficiency</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Time flown within 200nm, 100nm, and/or 40nm of destination</td>
<td>PDARs, Threaded Tracks</td>
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<tr>
<td>x*</td>
<td>x*</td>
<td>x*</td>
<td></td>
<td>Fuel burn between 104 key city-pairs</td>
<td>AAA</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Out-to-in or Off-to-On fuel burn between key city-pairs</td>
<td></td>
</tr>
</tbody>
</table>

### Horizontal Flight Efficiency

<table>
<thead>
<tr>
<th>Value</th>
<th>RECAT</th>
<th>Metrics</th>
<th>EFF</th>
<th>Metric</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>x*</td>
<td>x*</td>
<td>x*</td>
<td></td>
<td>Actual distance flown between 104 key city-pairs</td>
<td>PDARs, Threaded Tracks</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Distance flown within 200nm, 100nm, and/or 40nm of destination</td>
<td>PDARs, Threaded Tracks</td>
</tr>
</tbody>
</table>

### Vertical Flight Efficiency

<table>
<thead>
<tr>
<th>Value</th>
<th>RECAT</th>
<th>Metrics</th>
<th>EFF</th>
<th>Metric</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Time in level flight within 200nm, 100nm, and 40nm of destination</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Distance in level flight within 200nm, 100nm, and 40nm of destination</td>
<td>PDARs, Threaded Tracks</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Time-weighted altitude within 200nm, 100nm, and 40nm of destination</td>
<td>PDARs, Threaded Tracks</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>GCD between Top of Descent and destination</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Actual distance flown below Top of Descent</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Flights executing CDOs</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>Procedure utilization</td>
<td>PDARs, Threaded Tracks, CIFP</td>
</tr>
</tbody>
</table>

* Metrics recommended by NAC

## Initial Metrics - Flight Efficiency on Airport Surface

<table>
<thead>
<tr>
<th>Value</th>
<th>RECAT</th>
<th>Metrics</th>
<th>EFF</th>
<th>Metric</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>x*</td>
<td>x</td>
<td></td>
<td></td>
<td>Taxi-out time (actual Out-to-Off)</td>
<td>ASQP</td>
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<tr>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>Taxi-out time (Spot-to-Off)</td>
<td>ASDE-X</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>Runway queue delay</td>
<td>ASDE-X</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>Taxi-out delay</td>
<td></td>
</tr>
<tr>
<td>x*</td>
<td>x</td>
<td></td>
<td></td>
<td>Gate departure delay (actual Out – scheduled Out)</td>
<td>ASQP</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>Departure delay</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>EDCT delay</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>Fuel burn on airport surface (for flts. between key city-pairs)</td>
<td>AAA</td>
</tr>
</tbody>
</table>

* Metrics recommended by NAC
### Initial Metrics - Airport Capacity/Throughput

<table>
<thead>
<tr>
<th>Metric</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time or distance between successive departures by runway</td>
<td>ASDE-X</td>
</tr>
<tr>
<td>Time or distance between successive arrivals by runway</td>
<td>ASDE-X</td>
</tr>
<tr>
<td>Airport throughput: Facility reported rates (AAR+ADR) (VMC vs. non-VMC)</td>
<td>NTML/ASPM</td>
</tr>
<tr>
<td>Throughput: Avg of Hourly Throughput Rates (VMC vs. non-VMC)</td>
<td>PDARS, ASPM</td>
</tr>
<tr>
<td>Capacity: Avg of Daily Highest Quarter-hour Throughput (Max or 98th percentile) (VMC vs. non-VMC)</td>
<td>OPSNET, PDARS, ASPM</td>
</tr>
<tr>
<td>Demand: Avg of Daily Operations Count (VMC vs. non-VMC)</td>
<td>OPSNET, PDARS, ASPM</td>
</tr>
<tr>
<td>Time in VMC and non-VMC</td>
<td>METAR</td>
</tr>
</tbody>
</table>

* Metrics recommended by NAC

---

**Industry Response Metrics Tasking**

Margaret Jenny, RTCA
Response to FAA Tasking

PASSUR Aerospace has been selected as the vendor to build the Dashboard.

JAT members

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tim Campbell</td>
<td>NACSC Co-Chair (American Airlines)</td>
</tr>
<tr>
<td>Steve Dickson</td>
<td>NIWG Co-Chair (Delta Air Lines)</td>
</tr>
<tr>
<td>Melissa Rudinger</td>
<td>Co-Chair NACSC/NIWG (Aircraft Owners and Pilots Association)</td>
</tr>
<tr>
<td>Alex Burnett</td>
<td>United Airlines</td>
</tr>
<tr>
<td>Jim Crites</td>
<td>ACI-NA (Dallas/Fort Worth International Airport)</td>
</tr>
<tr>
<td>Ken Elliott</td>
<td>Jetcraft (General Aviation)</td>
</tr>
<tr>
<td>Ilhan Ince</td>
<td>American Airlines</td>
</tr>
<tr>
<td>Margaret Jenny</td>
<td>RTCA</td>
</tr>
<tr>
<td>Mark McHale</td>
<td>National Air Traffic Controllers Association (NATCA)</td>
</tr>
<tr>
<td>Bill Sperandio</td>
<td>Southwest Airlines</td>
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<tr>
<td>Kevin Swiatek</td>
<td>UPS</td>
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<tr>
<td>Lindsey Vandromme</td>
<td>Delta Air Lines</td>
</tr>
<tr>
<td>Bobbi Wells</td>
<td>FedEx Express</td>
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<table>
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<tbody>
<tr>
<td>Gary Beck</td>
<td>SME PBN (Alaska Airlines)</td>
</tr>
<tr>
<td>Steve Fulton</td>
<td>SME PBN (Sandel Avionics)</td>
</tr>
<tr>
<td>Glenn Morse</td>
<td>SME MRO (United Airlines)</td>
</tr>
<tr>
<td>Jon Tree</td>
<td>SME MRO (Boeing Digital Aviation Jeppesen)</td>
</tr>
</tbody>
</table>

NextGen Industry Performance Tracking and Analysis
October 8, 2015
PASSUR Foundational Elements

1. Aviation’s Big Data
   - Largest commercial, private, passive radar network
   - Unique information plus 10+ years archived data
   - Integrated with multiple additional data feeds (FAA/SWIM, customer, and other commercial feeds)

2. Established Platform
   - Integrated Platform of Business Intelligence solutions
   - Used today by airline and airport experts to increase capacity and efficiency
   - Protect and manage data from multiple sources

3. Widespread Industry Adoption
   - Serving the largest 5 North American airlines, >125 global airlines, 60+ airports, 300+ business aviation companies, and the US government

4. Aviation Intelligence Center Of Excellence
   - SMEs with backgrounds in airline/airport operations, operational performance analysis, air traffic management, systems automation, and data visualization
   - Understand complexity of NAS from multiple perspectives

Independent Surveillance Network

Over 180 radar locations covering North America from coast to coast, including locations in Europe and Asia
### PASSUR Data Sources

Proprietary internal sources integrated with multiple external sources

![PASSUR Database Diagram](image)

### 10+ Years of Data Collection, Reporting, and Problem Solving

Integrated into existing PASSUR products

<table>
<thead>
<tr>
<th>Customer Request Met by PASSUR</th>
<th>New Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic flow management/TMI mitigation</td>
<td>Deployment in 6 months; later implementation includes &quot;PASSUR Flight Status Monitor&quot; (PFSM) and &quot;On-Time Performance&quot; (OTP) metrics.</td>
</tr>
<tr>
<td>Departure metering, sequencing, and surface management</td>
<td>Deployment in 6 months; later implementation includes &quot;PASSUR Flight Forecasting&quot; (PFF) and &quot;On-Time Performance&quot; (OTP) metrics.</td>
</tr>
<tr>
<td>Flight predictability/gate to gate ETAs</td>
<td>Deployment in 6 months; later implementation includes &quot;PASSUR Flight Forecasting&quot; (PFF) and &quot;On-Time Performance&quot; (OTP) metrics.</td>
</tr>
<tr>
<td>Independent reporting of aviation fees and charges</td>
<td>Deployment in 6 months; later implementation includes &quot;PASSUR Flight Forecasting&quot; (PFF) and &quot;On-Time Performance&quot; (OTP) metrics.</td>
</tr>
<tr>
<td>Diversion management</td>
<td>Deployment in 6 months; later implementation includes &quot;PASSUR Flight Forecasting&quot; (PFF) and &quot;On-Time Performance&quot; (OTP) metrics.</td>
</tr>
</tbody>
</table>
10+ Years of Data Collection, Reporting, and Problem Solving

Traffic Flow Optimization

Dashboard

Selectable filters
10+ Years of Data Collection, Reporting, and Problem Solving

Traffic Flow Optimization

Download data to spreadsheet

Unique Data Sources and Integration

PASSUR “fuses” and integrates multiple data sources, selecting the “best” one

Metric: Distance Flown

- Surface tracks updated every one second via ASDE-X (or ASSC or PASSUR’s proprietary MLAT sensors)
- Terminal area tracks updated every 4.6 seconds via PASSUR passive surveillance radar (greater “fidelity” than ASDI tracks)
- En route tracks updated roughly every one minute via ASDI
Attachment 2
City Pair selected

Comparison tools
NextGen Industry Performance Tracking and Analysis
October 8, 2015

DISCUSSION
LUNCH

ATCA 60th Annual Conference & Exposition
Event Plan

November 1-4, 2015 | Washington, DC
NextGen at ATCA

NextGen is coordinating with vendors to create a Phases of Flight path weaving throughout the 60th Annual Exposition to show attendees, stakeholders, partners, and industry the impact of NextGen.

Our goal is to demonstrate how valued partners and stakeholders are all delivering NextGen from gate-to-gate. Through visual identification and a unified message that connects our technology to your service delivery, we want to send a clear message...

that NextGen is everywhere, impacting the daily operations of the entire national airspace system.

A trip to the tradeshow floor will make clear the depth of the investment in NextGen. The level of partnership representation will be apparent and impressive visual that NextGen isn’t something that will happen in the future; NextGen is being delivered today.

Event Floorplan

- NextGen will establish a have a booth in a 30”x30” space near the SWIM Theater.
- 20”x20” space will be used for booth design and signage with room for seating and conversation areas.
- Using visual markers and coordinated color schemes, participating vendors will have signage indicating what their role is in the delivery of NextGen technologies in the various Phases of Flight.
Partner Signage

The goal is to create a clearly identifiable visual connection between NextGen and our participating vendors. We’ve created a Partners in Delivering NextGen which will be seen all over the convention floor.

Vendors will be given a number of signage options to choose from.

We have partnered with vendors to demonstrate the influence of NextGen across the National Airspace System.

More than 40 companies will be displaying partnership identification in their booth on the exhibit floor.
Partners Delivering NextGen

A few of our participating vendors.
Automatic Dependent Surveillance - Broadcast (ADS-B)

Presented by
Jim Linney and Bruce DeCleene
Federal Aviation Administration
Agenda

• **ADS-B: Jim Linney**
  – ADS-B Portfolio and Infrastructure
  – Potential ADS-B Out Capabilities
  – ADS-B In Aviation Rulemaking Committee (ARC) Recommendations
  – ADS-B Applications (Initial, In Progress, Potential Future)
  – Summary
  – Applications
  – Overall
  – ADS-B Next Steps

• **ADS-B Avionics: Bruce DeCleene**

• Common Weather Picture: Jim Linney

---

**Automatic Dependent Surveillance - Broadcast (ADS-B) Out**

*Automatic*
  – Periodically transmits information with no pilot or operator input required

*Dependent*
  – Position and velocity vector are derived from the Global Positioning System (GPS)

*Surveillance -*
  – A method of determining position of aircraft, vehicles, or other asset

*Broadcast*
  – Transmitted information available to anyone with the appropriate receiving equipment
Ground Infrastructure

Potential Future ADS-B Out Capabilities

• 3 Nautical Mile (NM) En Route Separation
• Surveillance in Non Radar Airspace
• Space Based ADS-B
**Potential Future ADS-B Out Capabilities: Space Based Oceanic Separation**

**ADS-B In Aviation Rulemaking Committee Recommendations (ARC)**

- The ADS-B In ARC submitted a final report on a strategy for incorporating ADS-B In technologies into the National Airspace System (NAS)

- ADS-B In ARC recommended focusing on five key applications:
  - Flight-deck-based Interval Management-Spacing (FIM-S)
  - Cockpit Display of Traffic Information (CDTI)-Assisted Visual Separation (CAVS) and CDTI-Assisted Pilot Procedure (CAPP)
  - Flight-deck-based Interval Management-Defined Interval (FIM-DI)
    - This is considered a part of A-IM
  - Interval Management Defined Interval-Oceanic (IMDIO)
    - Now called Pairwise Trajectory Management (PTM), application considered part of A-IM
  - FIM-DI for Closely Spaced Parallel Runway Operations (CSPO)
    - This is considered a part of A-IM Paired Approach
Initial Applications

In Trail Procedures (ITP)
Cockpit Display of Traffic Information- Assisted Visual Separation (CAVS)

Traffic Situation Awareness with Alerts (TSAA)
Ground Based Interval Management – Spacing (GIM-S)

In Progress Applications: Interval Management – Spacing (IM-S) Arrivals, Approach & Cruise (AA&C)
**Recommended Future Applications**

- Advanced - Interval Management Pairwise Trajectory
- Advanced - Interval Management Paired Approach
- Advanced - Interval Management Paired Arrivals & Approach
- Ground Based Interval Management – Spacing (GIM-S) with Wake Mitigation
- Cockpit Display of Traffic Information (CDTI) – Assisted Pilot Procedure (CAPP)
- Airport Traffic Situation Awareness with Indications and Alerts (Surf-IA)

---

**Summary of ADS-B In Applications**

**Initial Applications**

- ITP
- CAVS
- TSAA
- GIM-S

**In Progress**

- IM-S AA&C

**Recommended**

- A-IM PTM
- A-IM PA
- A-IM A&A
- CAPP
- GIM-S with Wake Mitigation
- Surf-IA
Overall Summary

• ADS-B Out built the foundation
  – All Automation
  – Airborne applications
• Completed several applications
• Continuing the work on future applications

Next Steps

• Continue building the future applications
• Communication / facilitation with stakeholders
  – Continue to define industry benefits for ADS-B
    (Agreements, outreach, and the Equip 2020 forum)
In October 2014, FAA and industry convened an “ADS-B Call to Action” meeting to identify and address barriers to equipping with ADS-B Out by Jan. 1, 2020.

All agreed a collaborative approach was critical to meet the deadline, and identified issues which were divided amongst five working groups to address:

1. **Air Carrier Equipage**: Focus on the Part 121 and 135 community, tackling issues relevant to availability of equipment and its installation.
2. **General Aviation Equipage**: Focus on the General Aviation community, tackling issues relevant to availability of equipment and its installation.
3. **GPS Receiver and Performance-Based Rule Implications**: Focus on opportunities for sharing the risks of using unaugmented GPS equipment that does not meet the performance requirements of the rule for a limited time sufficient for certain operators to equip with SBAS or multi-constellation receivers.
4. **Education and Benefits**: Focus on coordinating education and outreach to the community concerning ADS-B Out requirements and benefits, as well as additional benefits that could be implemented for equipped aircraft.
5. **Installation and Approvals**: Focus on issues associated with ensuring efficient and consistent installations and approvals.
 Equip 2020

- Initially Equip 2020 and the Working Groups met on a monthly basis, and have met quarterly since June 2015
- Accomplishments so far include:
  - Published the Final Rule Technical Amendment to change the ADS-B Out TSO from “meet requirements” to “meet performance requirements”.
  - Published the ADS-B out GPS receiver transition period exemption process (see paragraph 2.5 for further information).
  - Initiated amendment to AC 90-114A to address avionics installation guidance for experimental and Light Sport aircraft and service availability prediction tool (SAPT) guidance to ensure rule compliant routing throughout the National Airspace System.
  - Developed an equipage tracking database to help track equipage trend.
  - Obtained commitment from the aircraft certification services to prioritize ADS-B system certifications.
  - Addressed pricing concerns for general aviation equipage.
  - Surveyed pilots and aircraft owners to identify the most effective means of reaching the GA community.
  - Developed new education tools for pilots and aircraft owners including: web site, approved equipment list, interactive airspace map, decision flow chart, FAQs

 NAC User Group Key Issues

- Several Key Issues are still being addressed:
  - GPS Receivers Exemption Request
  - Privacy concerns
  - Department of Defense Equipage
  - General Aviation Receivers
Air Carrier Update

Exemption 12555

- Many airlines equipped early on with GPS as part of the transition to satellite-based navigation, however this early equipage does not include the latest GPS receivers.
- Those early-generation GPS receivers may experience brief outages of the FAA’s required performance for ADS-B Out. Airplane manufacturers are upgrading GPS receivers across airplane models, but have said the upgraded receivers will not be available until 2018 to 2020.
- The FAA approved a five year limited exemption, applicable only from 91.227(c)(1)(i) & (iii) requirements under specific conditions and limitations.
- Operators applying for the exemption must notify the FAA of their intent to operate under the exemption
- The exemption is applicable to all affected U.S. and Foreign operators

Regional Carrier Update

- FAA affirmed exemption 12555 can be applied to regional air carriers
- Regional carriers identified available solutions
  - RAA and FAA are working with Equip 2020 to assure solutions become available for all platforms
Aircraft Privacy

Privacy Concerns - Potential real-time aircraft tracking by third parties

- White paper was developed by Equip 2020 delivered to the FAA at the June 2015 meeting which included several recommendations concerning mitigation of real-time aircraft tracking
- Principal recommendations;
  - Creation of an FAA “privacy” office that would administer the distribution of temporary flight IDs and,
  - Encrypting the Mode S flight IDs
- The FAA is reviewing these proposals for policy, cost and schedule implications and will report back to Equip 2020

Other Areas

Department of Defense (DoD) Equipage
- Bi-monthly DoD/FAA meetings are being held to discuss status and identified issues

Small Aircraft
- FAA, associations and industry are conducting education outreach about the rule and solutions

UAS
- Rule applies to UAS in rule airspace, experimental aircraft do not require a certified solution

Operational Requirements
- Equip 2020 certification working group is active in addressing approval and resource issues
### Equipage Status – Overall

#### ADS-B Link Version 2 Equipage - Historical Data

**Apr 2012 - Sept 2015**  
*Curve Based on Oct '14 - Sep ’15 data*

**All Aircraft (U.S. & Int’l)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Projected Equipage</th>
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<tbody>
<tr>
<td>Jan 1st, 2016</td>
<td>19,042</td>
</tr>
<tr>
<td>Jan 1st, 2017</td>
<td>34,373</td>
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<tr>
<td>Jan 1st, 2018</td>
<td>55,000</td>
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<td>Jan 1st, 2019</td>
<td>80,924</td>
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<tr>
<td>Jan 1st, 2020</td>
<td>112,145</td>
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### Equipage Status – U.S. Air Carrier

**Current as of 10/1/2015**

<table>
<thead>
<tr>
<th>US Air Carrier</th>
<th>Count</th>
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<tbody>
<tr>
<td>UPS</td>
<td>167 (E300, 13 B747, 38 B767, 26 MD11, 5 MD71)</td>
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<tr>
<td>Skywest</td>
<td>45 (E170)</td>
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<tr>
<td>JetBlue</td>
<td>35 (A320)</td>
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<tr>
<td>Air Shuttle</td>
<td>30 (E170)</td>
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<tr>
<td>Delta</td>
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<tr>
<td>American Airlines</td>
<td>20 A310</td>
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<tr>
<td>FedEx</td>
<td>19 (17 B767, 2 B777)</td>
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<tr>
<td>Compass (AA)</td>
<td>12 (E170)</td>
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<tr>
<td>Alaska Airlines</td>
<td>7 B737</td>
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<td><strong>Total</strong></td>
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General Aviation (in this context) includes part 91 and part 135 operations.

Considering the current equipage rate, both total equipage and rule compliant operations will be a concern as the 2020 deadline approaches.
- Repair Station capability, today, is adequate to perform the installations.
- Production capacity of the Manufacturers is satisfactory to meet the proposed schedule.

Next Steps – determining how to ensure aircraft are being equipped to meet the rule.

Common Weather Picture
Evolution to NextGen Weather Systems

Today's Weather Systems
- ITWS
- ITWS WARP
- CIWS WARP
- ITWS WARP
- ITWS

Future Weather Systems
- CSS-Wx and NWP

Weather for En Route ATC

Today's Weather Systems
- Corridor Integrated Weather System (CIWS)
- Weather and Radar Processor (WARP)
- ATC Systems
  - ERAM with Integrated Weather Information

Future Weather Systems
- NextGen Weather Processor (NWP)
- ATC Systems
  - ERAM with Integrated Weather Information
- Common Support Services-Weather (CSS-Wx)
Weather for Terminal ATC

Today's Weather Systems

- Integrated Terminal Weather System (ITWS)
- Surveillance RADAR- Wx (ASR, ARSR, CARSR)
- ATC Systems
- Standard Terminal Automation Replacement System (STARS)

Future Weather Systems

- NextGen Weather Processor (NWP)
- Common Support Services- Weather (CSS-Wx)
- Aviation Weather Display (AWD)
- Surveillance RADAR- Wx (ASR)
- ATC Systems
- Standard Terminal Automation Replacement System (STARS)

DISCUSSION
Performance Based Navigation (PBN) National Airspace System Navigation Strategy

Update on the PBN NAS Navigation Strategy

NAC
Joshua Gustin, PBN Program Manager
Mark Bradley, Delta – PARC Chair
October 8, 2015
Strategy Status Report

• PBN Strategy briefed to NAC – June 5
  + Outcome was that PARC would conduct a technical review of the strategy
    • Identify other items for the NAC to address
    • Report back to NAC on progress

• PARC kickoff to review strategy – Aug 17-21
  + Monthly updates/telecons

### PARC Action Teams

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<th>Activity</th>
<th>Objective</th>
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<td>GBAS</td>
<td>Tie in GBAS to the PBN strategy and further define the cost-benefit business case</td>
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<tr>
<td>Defining PBN</td>
<td>PBN discussion to address end state capabilities and transition strategy</td>
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<tr>
<td>Circling Minima</td>
<td>Circling minima removal and strategic implications</td>
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<tr>
<td>Guided Visual Approach Procedures</td>
<td>Visual approach procedures allowing for ATC clearance, while requiring aircraft adherence to an instrument based procedure</td>
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<tr>
<td>Resiliency</td>
<td>Further clarification of DME backup strategy</td>
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<tr>
<td>Mixed Equipage</td>
<td>Industry support of the concepts associated with equipage requirements</td>
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Potential Items for NAC

- **Flow Management** - The importance of flow management and the associated automation capabilities (e.g., TBFM, TSAS) are well known, however discussions during the week identified that additional focus by the NAC in this area is needed.

- **Approval/Oversight Process** - Reaffirm the criticality of an efficient and effective approval and oversight process for/at FSDOs and Cert. locations, which is part and parcel of the transition from strategy to implementation.

Timeline through Q1 FY16

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<td>11/30</td>
<td>Revision 1.0</td>
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<td>NAC</td>
<td>10/8</td>
<td>PBN Ad Hoc update, Briefing on referred items</td>
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DISCUSSION
Long-Term Guidance

Vision View

Architectural View

Capabilities View

NextGen Long-Term Goals

For Airlines: Trajectory Management
- Improved Predictability
- Collaborative Decision Making
- Global Interoperability
- Integration of New Entrants
- Resiliency

For GA: Flexibility/Access
- Precision Approach
- Increased Situational Awareness
- Improved Safety
- Collaborative Decision Making

DoD and Others
Trajectory Operations

Fundamental Elements

- **End-to-End**: Time, Track, Spacing, Metering
  - PBN ○ ADS-B ○ TBFM  Automation Platforms

- **Data Integration**: Across All Platforms-Both Ground/Air
  - SWIM ○ ADS-B ○ Data Comm  Automation Platforms

- **Managing Constraints**: Ability to Gather, Integrate, Across Users
  - SWIM ○ CATM ○ CSS-Wx

- **Communication**: of Collaborative Picture/Constraints/Instructions
  - Data Comm ○ NVS ○ ADS-B ○ AAtS

---

Flexibility/Access

Fundamental Elements

- **Precision Approach**: To near CAT 1 precision with stable approach
  - WAAS

- **Increased Situational Awareness**: Pilots see traffic big picture
  - ADS-B ○ TIS-B

- **Improved Safety**: Uplink of Weather
  - ADS-B ○ TIS-B

- **Collaborative Decision Making**: Access to Constraint Data
  - SWIM ○ AAtS
## Transformational Investments in CNS-A

### Communications
- Voice to Data
- Move to Internet Protocol (IP)
- Standards Based Info Exchange
- Critical/Non-Critical Using All Transmit Paths

### Surveillance
- High Update Rate Precision Data
- Cockpit-Based Applications
- Two-way Data (Traffic, Weather)
- Information Exchange

### Navigation
- Performance Based
- New Standards/Procedures

### Automation
- Tower, TRACON, En Route, Command Center
- Higher Capacity/Processing
- Platform to Integrate New Apps
- Information Exchange Enabled

---

### The Enterprise Transformation

**DataComm**
- Complex Clearance
- Trajectory Info
- Pairwise Separation
- EFVS
- Dynamic Collision Avoidance
- RTA

**NVS**
- Enable UAS pilot communication
- Resilency

**En Route**
- ERAM / TBFM

**TRACON**
- TAMR / TFDM

**Tower**
- TFDM

**PIB**
- Dispersed Heading

**Command Center**
- CATM

**AIR**
- Aeromedical
- Flight
- Weather

**DOD**
- NAV

**Airports**
- Airlines

**FAA**
- High Update Rate Precision Data
- Cockpit-Based Applications
- Two-way Data (Traffic, Weather)
- Information Exchange

**Integration Center**
- Greater SA
- Precision Approach
- Weather

**UAS**
- Enable UAS pilot communication
- Resilency

**RTA**
- Dynamic Collision Avoidance
- RTA

**EFVS**
- Enable UAS pilot communication
- Resilency

**TAMR / TFDM**
- Dispersed Heading

**ERAM / TBFM**
- Complex Clearance

**TFDM**
- Dynamic Collision Avoidance
- RTA

**TBFM**
- Trajectory Info
- Pairwise Separation

---
Future Focus Areas

- Delivering Improved Services to Users
  - PBN – Everywhere/Always
  - Unified Surveillance – Finish Equipage Base/Build Cockpit Environment
  - Data Comm – Finish Transition from Voice to Data

- Seamless Integration Across the NAS and Beyond
  - Information Management, Collaborative Decision Making, Global Interoperability – As Building Blocks to Trajectory Based Operations

- Meeting New Service Challenges
  - New Entrants, Cyber Security, Resiliency, Cost Containment

Challenges

- Need to achieve balance between immediate return on investment and long-term modernization objectives

- All users/providers need to move forward together for system to work

- FAA leading with investments – users must follow closely

- Transition to new NAS with appropriate removal of old NAS
Conclusion

• FAA’s Conops, EA and NSIP provide a sound planning base for the NextGen horizon

• NextGen vision is both far reaching, but with smaller achievable steps that deliver benefits

• The agency is making good progress on delivery of transformational systems and capabilities envisioned in the Conops

• Continued progress is dependent on everyone moving forward together

Acronyms

• AAIS – Aircraft Access to SWIM
• ADS-B – Automatic Dependent Surveillance-Broadcast
• ADS-B/TIS-B – Automatic Dependent Surveillance-Broadcast/Traffic Information Service-Broadcast
• ANSPs – Air Navigation Service Providers
• CAT-1 – Category 1 Approach
• CATM – Collaborative Air Traffic Management
• CNS-A – Communications, Navigation, Surveillance – Automation
• CONOPS – Concept of Operations
• CSS-Wx – Common Support Services - Weather
• Data Comm – Data Communications
• DOD – Department of Defense
• EFVS – Enhanced Flight Vision System
• ERAM – En Route Automation Modernization
• NAS – National Airspace System
• NVS – NAS Voice System
• NWS – National Weather Service
• PBN – Performance Based Navigation
• SA – Situational Awareness

• SWIM – System Wide Information Management
• TAMR – Terminal Automation Modernization and Replacement
• TBFM – Time Based Flow Management
• TFDM – Tower Flight Data Manager
• TRACON – Terminal Radar Approach Control
• WAAS – Wide Area Augmentation System
DISCUSSION

Summary of Meeting & Next Steps
DFO and NAC Chairman
Closing Comments

Michael Whitaker, FAA DFO
Richard Anderson, NAC Chairman

Action Items
Other Business

2016 Meeting Schedule

- February 25 – Atlanta, GA, Delta Air Lines
- June 17 – Washington, DC
- October 6 – Orlando, FL, JetBlue
  - Optional Pre-NAC Tour Harris Corp – Melbourne, FL (October 4)
Adjourn
Action Items

- Determine how the NAC/NACSC can address community outreach in the implementation of PBN (community impacts)
- NAC accepted October updates to NextGen priorities
- NIWG initiate rolling plan
- Report on ADS-B equipage status for air carrier and general aviation at future NAC meetings
- Carriers will report on status of plans for output of 2020 fleets equipage of ADS-B (release-able data should be de-identified)
- Pending FAA tasking as a result of PARC work on PBN strategy
- NAC needs to promote benefits received by the aviation industry from NextGen implementations – specifically JFK PBN implementation and Memphis Wake ReCat
Meeting Summary, June 5, 2015

NextGen Advisory Committee (NAC)

The fifteenth meeting of the NextGen Advisory Committee (NAC) was held on June 5, 2015 at RTCA, Inc., 1150 18th Street NW Suite 910, Washington DC. The meeting discussions are summarized below.

List of attachments:

- Attachment 1 - Attendees
- Attachment 2 - Presentations for the Committee meeting - (containing much of the detail on the content covered during the meeting)
- Attachment 3 - Approved February 26, 2015 Meeting Summary
- Attachment 4 - NAC Chairman’s Report
- Attachment 5 - FAA Report from The Honorable Michael Whitaker, FAA Deputy Administrator
- Attachment 6 – NACSC Ad Hoc Metrics Group Report
- Attachment 7 – NAC Ad Hoc ADS-B Report
- Attachment 8 - FAA Response to RTCA “Blueprint for Success to Implementing Performance Based Navigation” Recommendations
- Attachment 9 – Chief NextGen Officer update to Congress 2015

Welcome and Introductions

Chairman Anderson opened the meeting at 9 a.m. by welcoming the NAC members and others in attendance. All NAC members and attendees from the general public, including those joining virtually via WebEx phone/internet, were asked to introduce themselves (attendees are identified in Attachment 1 and the presentation used during the conduct of the meeting are contained in Attachment 2).
Designated Federal Official Statement

In his role as the DFO, The Honorable Michael Whitaker (FAA Deputy Administrator) read the Federal Advisory Committee Act notice, governing the public meeting.

Approval of February 26, 2015 Meeting Summary

Chairman Anderson asked for consideration of the written Summary of the February 26, 2015 meeting. By motion, the Committee approved the Summary (Attachment 3).

Chairman's Remarks

The following is a summary of the remarks made by Chairman Anderson (Attachment 4):

Chairman Anderson thanked the FAA for its continued commitment to work with the Industry in the implementation of NextGen capabilities. He emphasized the “common motivation” of members of the community with different perspectives but with the common goal of advancing efficiency and safety of the ATC system. He commended the NextGen Integration Working Group (NIWG) for receiving the Achievement Award at the RTCA Symposium earlier in the week.

Chairman Anderson commented that prior to the NAC meeting, the NAC received a briefing from members of the National Research Council (NRC) of the National Academy of Sciences on its recent report, "A Review of the Next Generation Air Transportation System: Implications and Importance of System Architecture." This discussion put into perspective how the NAC and its predecessors at RTCA have been consistently focused on the successful implementation of NextGen, in an evolutionary manner that delivers benefits, bolsters collective confidence and encourages investments.

He stated that since the last meeting:

- The FAA and industry have been working on implementing surface capabilities of Electronic Flight Strips and Departure Metering building.
- There was progress on Wake ReCat that continues delivering “huge” benefits and in an accelerated implementation time-frame.
• The Ad Hoc Metrics group had reached consensus on six metrics for tracking performance improvements following the implementation of the top four operational capabilities.

Chairman Anderson highlighted that during the meeting, the Committee would:

• Consider a NACSC recommendation for six metrics to track the impacts of implementing capabilities in the four priority areas.
• Discuss for approval the ADS-B Ad Hoc group findings, led by General Tuck, working closely with Marke Gibson of the NextGen Institute.
• Receive a briefing and discuss the FAA’s response to the NAC’s Blueprint for Performance Based Navigation Procedures Implementation Report.

He emphasized the desire on the part of industry to see a comprehensive plan from the FAA for the eleven tier 1 capabilities that includes needed investments, deployment dates, and expected benefits, calling this classic project management.

FAA Report - Mike Whitaker, Deputy Administrator, FAA

The following are highlights of Mr. Whitaker’s remarks. The details are contained in the official FAA report (Attachment 5).

Mr. Whitaker stated that the industry partnership has led to substantial progress in several of the key NextGen technologies, since the last NAC meeting in February.

ERAM – Mr. Whitaker thanked the National Air Traffic Controllers Association (NATCA), Professional Aviation Safety Specialists (PASS) and Lockheed Martin for helping to make ERAM fully operational at 20 En route centers. He also highlighted how ERAM is the backbone of the national ATC system serving as the platform for other NextGen technologies such as ADS-B and DataComm.

DataComm – Mr. Whitaker expressed appreciation to FedEx Express, UPS, United Airlines, Harris and Thales Cooperation, for the successful trials of DataComm at Memphis and Newark. While highlighting the game-changer that DataComm is, Mr. Whitaker also communicated to the NAC that during the summer DataComm will be rolled out at Houston’s two major airports and Salt Lake City, and that 53 more airports will be added in 2016.

ADS-B – JetBlue, NATCA and PASS were recognized for conducting a successful demonstration of ADS-B coverage with JetBlue aircraft. The FAA is working closely with the Aircraft Owners and Pilots
Association (AOPA) to educate general aviation aircraft (GA) owners. He stated that a recent survey found that 56% of GA owners surveyed indicated that until the price comes down they did not plan to install ADS-B. While the aviation community does face a tough challenge in getting everyone equipped for the 2020 mandate, Mr. Whitaker assured the NAC that the FAA was working together with all the partners and the ADS-B Ad Hoc Group to identify and get past any barriers to meeting the deadline.

**Benefits to everyone as we continue to build the system** – Mr. Whitaker mentioned the work carried out by McKinsey Consulting that identified $1.6 billion in system-wide benefits, with more than $500 million going directly to aircraft operators. He also stated that the FAA expected NextGen capabilities to continue to produce an additional $11.4 billion over the next 15 years. Mr. Whitaker thanked the Industry for its partnership with the FAA, as it allowed for maintaining schedules in modernizing the national ATC system. Last year Houston and North Texas Metroplex plans were successfully implemented, and this year the same was done with Washington D.C. and Northern California areas. Mr. Whitaker added that while some of NextGen projects have gone on without a hitch, others continue to be controversial to the general public, and that the FAA is working hard to minimize significant impacts of the proposed changes.

**Importance of the NAC partnership** – Mr. Whitaker noted that the work on the NAC is an excellent example of what we can accomplish when government and industry partner on achieving common goals. Reviewing the work of the NIWG and its joint implementation plan, he stated that in 2014, 19 commitments were delivered collectively – three ahead of schedule. In order to tackle the modernization of the U.S. airspace system, he stated that they are using a pragmatic approach that matches investments with tangible benefits to airlines and passengers.

**PBN Strategy** – Mr. Whitaker explained that the FAA has initiated a cross-agency effort to develop a PBN strategy that identifies the key navigation capabilities and operations needed over the next 15 years. It lays out a roadmap for deploying and effectively using PBN in the NAS while ensuring safety and efficiency. He emphasized the importance for Industry and FAA to agree on a strategy that will allow for a transformation, while providing the framework that supports the broader NextGen efforts.

PBN Program Manager Josh Gustin and FAA Flight Technologies and Procedures Division Manager Bruce DeCleene led a discussion of the FAA’s planned revision of the 2006 PBN Roadmap.
In response to questions and comments from several members of the Committee related to the need to maintain legacy ground based Navaids for up to 15 years (specifically VHF omnidirectional range (VORs)), the FAA representatives explained that they would still be necessary although the number would decrease over time. They also noted that it was in large part determined by the industry and that a VOR Minimum Operating Network was being finalized.

A Committee member asked if the implementation of ADS-B in 2020 changes the current system and accelerates the implementation of the VOR MON. An FAA representative noted that it will be a part of the PBN Strategy. A controller representative expressed the need for resiliency and redundancy as the system transitions and commented that a shell system of ground aids are necessary. The cost and scope will also need to be determined.

During the briefing it was noted that the transition will take 15-years; PBN is the preferred Navaid with a ground based back-up; there are various operational concepts that need to be resolved; and various levels of capabilities drive equipage.

In response to a question about the assumptions related to automation, Mr. DeCleene commented that there is a need to have an understanding of how the various platforms and capabilities fit into the plans for the PBN Strategy including the integration of DataComm. A Committee member expressed the belief that this would actually help drive the transition in the use of DataComm.

It was also noted by a Committee member that because GPS is a necessary component of ADS-B for surveillance it may also drive the equipage rates and facilitate the implementation of “GPS only” airspace. Another cautioned that the trade-offs related to any mandated access limits must be identified.

A discussion took place about the use of GPS for other than Surveillance, including Navigation. It was suggested by the FAA that although the PARC produced good work regarding this issue, if we now step back and look at the bigger NextGen integrated C, N and S, the scope of addressing the integration issues would likely need come to the NAC.

The discussion concluded with next steps, and later reaffirmed by the Committee, that the FAA’s PBN Aviation Rulemaking Committee would take the first steps in reviewing the existing policy and developing a recommendation for consideration by the NAC. The process will include representatives.
from the NIWG and PBN Blueprint Task Group as well as the NAC Subcommittee to provide important industry policy input and report back to the NAC.

**Steady Funding and Reauthorization** – Mr. Whitaker stated that the FAA remains confident that the benefits of NextGen will only increase as more capabilities come on line, but that this will only happen if there is a continuous, reliable source of funding to deliver the next milestones. He informed the NAC that the FAA’s current authorization expires on September 30, 2015, and the FAA is committed to working closely with Congress to pass a long-term bill. The reauthorization must enable the FAA and the industry to continue the progress in modernizing the air traffic system.

**NextGen Integration Working Group**

**Priority Area Reports**

Continuing the work begun last fall, the Committee received reports from the joint FAA-Industry NIWG on progress implementing the four priority areas of NextGen capabilities. The goal of the NIWG is to deliver measurable benefits by dates certain, and, thereby, increasing the community’s confidence in NextGen.

The Industry Leads and the FAA Subject Matter Experts (SMEs) for each of the four focus areas presented a report on the consensus recommendations.

**Surface**

- FAA SMEs: Robert Varcadipane (ATO) and Nick Lento (NG)
- Industry Leads: Rob Goldman (Delta Air Lines), Steve Vail (Mosaic ATM, Inc.)

The SMEs and the Team Leads reviewed the status of the implementations and pre-implementation activities that includes airport participation in Collaborative Decision Making (CDM) and access to surface data (SWIM); Airport Surface Departure Metering; Advanced Electronic Flight Strips (AEFS); and utilizing Earliest Off Block Time (EBOT) for short range flights.

FAA Committee member Ms. Teri Bristol, Chief Operating Officer, Air Traffic Organization, also discussed the issue of obtaining accurate surveillance data for non-cooperative (non-ADS-B equipped) ground vehicles at Airport Surface Surveillance Capability (ASSC) sites. In a related action, the FAA issued guidance to aircraft operators advising them of the need to keep transponders on
until aircraft are parked. A controller representative, while stating the quality of the displays is good, expressed concern of the air traffic controller’s inability to see aircraft and/or ground vehicles at ASSC sites. NACSC Co-Chair Mr. Tim Campbell, Senior Vice President Air Operations, American Airlines, also commented that his company is looking at alternatives for ground vehicles because they value the ability to have accurate surveillance data on their operations.

Mr. Ed Bolton, FAA Assistant Administrator, NextGen, announced the FAA’s intent to implement a departure metering capability at Charlotte Douglas International Airport (CLT) as a result of a feasibility assessment. This is being done through a technology transfer from NASA. In response, Mr. Campbell expressed appreciation to the FAA for its work on implementing the capability at CLT.

During a discussion on access to System Wide Information Management (SWIM) data by airport operators to participate in CDM, the FAA committed to brief the NAC Subcommittee on the status of customer participation at its July meeting.

Responding to a question about the benefit of EOBT, Mr. Goldman explained that it provides the FAA with better data from “close in airports” (those located in close proximity to hub airports) of when the aircraft will be ready to leave a gate and enter into the traffic flow for the hub. It is initiated by communicating when the first boarding pass is processed. A Committee member from Europe explained that they are taking similar steps to have an expectation of when aircraft will be departing.

Performance-Based Navigation (PBN)

- FAA SMES: Josh Gustin (ATO), Donna Creasap (NG)
- Industry Leads: Gary Beck (Alaska Airlines), Steve Fulton (Sandel Avionics)

The Team reviewed the following actions:

- Complete Established on RNP (EoR) Special Authorization for Widely Spaced Operations at Denver (2015) – waiver has significantly increased utilization
- Develop a National Standard for EoR Widely Spaced Operations (2017)
- Complete an EoR RNP Track-to-Fix Safety Assessment (2015)
• Complete 3 additional Metroplex sites: Northern California (2015), Charlotte (2017), and Atlanta (2017)
• Complete a Las Vegas Basin Assessment (2014) – FAA is moving forward with a Metroplex initiative. The study team will be in place to give a report by the end of calendar year.

The industry team leads commented that Seattle, WA has also experienced savings in fuel consumption and emissions since EOR AR procedures were implemented in April. In addition, the procedures were important to minimize the capacity effects from a runway closure.

A Committee member stated that RNP approaches at JFK were instrumental in helping to reduce the impact on operations during runway construction projects. The member also encouraged the FAA and industry to implement NextGen in the New York area.

Multiple Runway Operations

• FAA SMEs: Tom Skiles (ATO), Paul Strande (NG)
• Industry Leads: Glenn Morse (United Air Lines), Jon Tree (The Boeing Company)

The briefing highlighted that nine Wake Recategorization (Wake ReCat) sites are “maturing” and that the FAA and industry are seeing significant benefits from this capability. It was noted that the industry is realizing benefits at Boston Logan; a safety analysis is underway at San Francisco; and Chicago will be moving forward in late June.

Chairman Anderson concluded the discussion by expressing appreciation for the FAA’s response to industry request for expediting Wake ReCat implementation and encouraged continued acceleration of the capability.

DataComm

• FAA SMEs: Jessie Wijntjes (ATO), Paul Fontaine (NG)
• Industry Leads: Dan Allen (FedEx Express), John O’Sullivan (Harris Corporation)
• Tim Leonard (Southwest Airlines)

Mr. Wijntjes discussed the FAA program for Surface DataComm pre-departure clearances and En route Controller-Pilot DataLink Communications (CPDLC). He addressed questions about assessments and protections of DataComm equipment and communication from cyber-attacks resulting in a compromise of the message. This was in response to comments made by representatives of the
National Academy of Sciences during the morning briefing on its NextGen report. Mr. Wijntjes explained that the program underwent extensive security analysis and testing.

After discussion by the Committee members on the question of DataComm security, it was agreed that the FAA’s Aviation Safety organization will brief the NAC and NACSC airline Chief Information Officers about steps taken to ensure the communications process and procedures for the DataComm program are secure and subject to appropriate steps to ensure safety against cyber-attacks.

Mr. Allen commented that energy was building among the airlines to equip as the FAA implements the ground infrastructure. A Committee member asked if there should be a mandated date for equipage. In response Committee members noted that DataComm proves the principle of best capable-best served; installations can be complicated by cockpit integration issues that make mandates difficult; and that the industry is typically opposed to mandates and this is a case where the market works well. In the case of En route CPDLC, the benefits alone close the business case for equipage and a mandate is not needed.

The discussion on DataComm ended after Mr. Tim Leonard, Director Compliance & Operations, FAR Part 119 Chief Pilot, Flight Operations, Southwest Airlines, provided his organization’s investment information in new equipage. The investments and associated business case assessments are based on the FAA’s implementation of NextGen capabilities, PBN, DataComm benefits and the pending ADS-B January 2020 compliance deadline.

**Harmonization of DataComm**

Steve Bradford, Chief Scientist, Architecture and NextGen Development, FAA, provided a briefing about the roadmap for interoperability between the FAA’s NextGen program and Europe’s SESAR. He commented that 2017 is an important milestone for determining investments necessary to fully implement the 2025 harmonization between the US and Europe.

**NACSC Metrics Ad Hoc Group Report**
Mr. Tim Campbell of American Airlines and Ms. Melissa Rudinger, Vice President Government Affairs, AOPA, reviewed the recommendation for NAC consideration designed to meet the following Task from the February NAC meeting:

Building on the FAA-proposed small number of high-level performance metrics, identify a high level suite of existing metrics that measure the effect on NAS performance attributable to the deployment of the of the four key capabilities outlined in the “NextGen Priorities Joint Implementation Plan” published in October 2014.

The NACSC formed an ad hoc metrics working group consisting of air carriers, airports, business/general aviation, controllers, FAA SMEs, MITRE and RTCA. The Ad Hoc Group used a decision support tool to help determine ranked criteria to measure proposed metrics, as well as a means to ensure the metrics best mapped to all four key NextGen capabilities.

The work performed by the metrics Ad Hoc Group reinforced the need for on-going, collaborative analysis to capture the impact of NextGen capabilities in a complex and dynamic NAS. As such, the Ad Hoc Group felt it was also important to propose a process to harmonize interpretations of changes in high-level metrics as NextGen capabilities are implemented.

The Committee was presented a high level suite of metrics to measure the effect on NAS performance attributable to the deployment of the capabilities in the four priority areas:

1. Actual Block Time
2. Actual Distance Flown Measured by city pairs
3. Estimated Fuel Burn
4. Throughput – Facility Reported Capacity Rates Measured at airports
5. Taxi-Out Time
6. Gate Departure Delay

Following the briefing, a Committee member commented that PBN procedures may be functioning as designed, but could negatively affect block times if requisite air traffic controller metering tools are not in place to accommodate their use. Mr. Campbell responded that metrics would identify these issues that could then be addressed in follow-up work by implementation teams. He emphasized that the intent is not using metrics as “gotchas” or to embarrass the FAA but to increase efficiency.

In response to a question about whether the NAS can provide access for new technologies such as Unmanned Aircraft Systems, Mr. Campbell explained that the subsequent levels of analysis would be
needed to discern this ability. Another pointed out that UAS will increase the number of vehicles operating in the system and this must be factored into the future metrics and analysis.

Chairman Anderson observed that it may be necessary to note the reasons for the differences between published arrival rates versus the actual arrival rate. An FAA Committee member commented that it will be necessary to bring the appropriate experts together to identify how this should work.

Mr. Whitaker observed that for now, the metrics should relate to the implementation in the four priority areas. This was echoed by another FAA Committee member.

Mr. Campbell initiated a conversation about the aviation industry using a third party to create a dashboard to also track performance. Chairman Anderson explained that this could be done under the auspices of RTCA. A Committee member commented that NextGen started with efficiency, environmental and safety enhancements that provide benefits to all users and this should be covered by this effort. Another stated that there is a need to continue the dialogue between the industry and the FAA.

Chairman Anderson summarized that the purpose or collaboratively monitoring performance is not to say “gotcha”, but to gauge how we are doing with implementation and identify future opportunities. It is also important that GA sees benefits from these implementations.

Another from the FAA pointed out that the desire to monetize the metrics and to hire a firm to develop an industry dashboard is new to the FAA.

**Committee Action:** The Committee agreed by consensus to approve the recommendation, NACSC Metrics Ad Hoc Group Report (Attachment 6), containing 6 high level Performance Metrics for the 4 Focus Areas.

In addition, the NAC endorsed two follow-on activities:

1. The FAA will begin acting upon the metrics.
2. The aviation industry, through RTCA, with engagement by the FAA, will select an independent vendor to provide a dashboard and associated analytic capability to track performance in support of the NAC.
NAC ADS-B Ad Hoc Group Report

Giovanni Tuck, Brigadier General, US Air Force led the presentation, examining what implementation commitments are necessary for the 2020 ADS-B implementation mandate. The recommendation, closely coordinated with the Equip 2020 initiative, covers air carriers, business and general aviation, Unmanned Aircraft Systems (UAS) and the Department of Defense (DoD).

The presenters, issues and resolution are outlined below:

- Mainline Carriers - A4A - Paul McGraw
  Maximizing the use of existing equipage and precluding multiple aircraft retrofits; airlines will comply with mandate.

- Regional Airlines - SkyWest - Chip Childs
  Maximizing the use of existing equipage and identifying missing pieces of information needed to make decisions regarding compliance plans.

- Small Aircraft - AOPA - Mark Baker
  Economical ADS-B solution for Small aircraft: including the need for developing a performance standard with the stipulation that it would not affect the ADS-B rule; needing standards for GA, including TSO versus non-TSO question, cost of equipage, and pathway for equipping, exemption for experimental aircraft.

- Privacy - NBAA - Ed Bolen
  Aircraft privacy: determining how to provide the ability for aircraft operators to block the broadcast of specific “N” numbers if requested by the aircraft operators. This ability is required to be provided by the FAA and the need for encrypting broadcast with unique identification and the pathway for this capability.

- DoD - US Air Force - Maj Gen Tuck, Chair
  Department of Defense: identifying the unique challenges of DoD commitments to meet the 2020 implementation, including the pathway to equipping, mission critical need for anonymity.

- UAS - Insitu - Ryan Hartman
  Unmanned Aircraft Systems (UAS): identifying issues associated with the UAS operations to meet the mandate including pathway to equipping, weight, cost, and certain questions related to UAS.
• Other identified operational barriers that must be addressed in order to comply by 2020:
  1. Path for equipage for aircraft that do not have an affordable or technical pathway to an integrated solution
  2. FAA certification of avionics and installations
  3. Capacity of repair stations to install equipment
  4. Education & outreach

After a discussion of these issues, the Committee took the following action:

Committee Action: The Committee agreed by consensus to approve the recommendation, NAC Ad Hoc ADS-B Report (Attachment 7) and sunset the NAC ADS-B Ad Hoc.

The NAC also approved the following actions:

1. The FAA will brief the Committee at future meetings, as a standing agenda item, on the status of actions related to ADS-B implementation including the actions of the Equip 2020 initiative and the status of the elements recommended by the Ad Hoc. The FAA will also provide information to the NAC on benefits being accrued associated with ADS-B Out, as well as information on fleet installation and identification of issues that require additional follow-up.

2. The NAC also requested updates on space-based ADS-B deployment and oceanic surveillance, and the common weather picture.

Following approval, Chairman Anderson thanked the members of the Ad Hoc and recognized Major General Tuck for his leadership.

FAA Response to RTCA “Blueprint for Success to Implementing Performance Based Navigation” Recommendations

Josh Gustin, FAA, provided the FAA response to the NAC recommendation, “The Blueprint for Success to Implementing Performance Based Navigation (PBN) Procedures”, that captures the lessons learned from PBN implementations across the country and provides a checklist for future implementations.

The majority of the recommendations were accepted by the FAA, including those related to community outreach and technical and non-technical stakeholder engagement, and the capturing of
lessons learned. On the areas of partial concurrence, the operators on the NAC continued to press for the availability of RNP procedures on the Automation Terminal Information Services (ATIS) and expressed interest in the FAA implementation as outlined in the response document. The other area of partial concurrence related to metrics will be addressed in several forums, including the ongoing collaborative efforts of the NIWG.

Summary of Meeting and Next Steps

The NAC Secretary summarized the following actions from the meeting and follow-up items (these are contained in a table below):

1.) ADS-B – Approved the ADS-B Ad Hoc Task Group report and associated recommendations with suggested mitigation strategies for challenges to implementation of the 2020 ADS-B implementation mandate for general aviation, UAS and DoD. The Ad Hoc completed its work and the NAC approved the following next steps:
   a. The FAA will brief the Committee at future meetings (as a standing agenda item) on the status of actions related to ADS-B implementation, including the actions of the Equip 2020 initiative and the status of the elements recommended by the Ad Hoc. The FAA will also provide information to the NAC on benefits and fleet installation and identification of issues that require additional follow-up.
   b. In addition, the NAC also requested additional information to be presented, related to space-based ADS-B deployment, oceanic surveillance and the common weather picture.

2.) Metrics – Approved 6 high level Performance Metrics for the 4 Focus Areas as recommended by the NACSC. There are two follow-on activities:
   a. The FAA will begin acting upon the metrics.
   b. The aviation industry, through RTCA, with engagement by the FAA will:
      i. develop an RFP for a 3rd party to measure implementation
      ii. provide the RFP to a set of vendors
      iii. evaluate the responses
      iv. select a vendor
      v. report to the NAC at the October meeting
3.) PBN NAS Navigation Strategy – the NACSC will review the FAA PARC developed industry input on the FAA’s planned revision of the 2006 PBN Roadmap and report back to the NAC.

4.) Access to SWIM data by airport operators – The FAA (Teri Bristol) will have a detailed plan in response to question/concerns expressed about SWIM access with a commitment to brief the NACSC at the July meeting on customer responsibilities.

5.) DataComm Security Protections – the FAA (John Hickey/Teri Bristol) will communicate with airline Chief Information Officers on steps taken to ensure the communications process and procedures are secure and subject to the appropriate steps to ensure safety against cyber-attacks.

6.) The Committee requested a briefing of the NextGen implementation Concept of Operations to include elements, benefits and timeframes.

**Recommendations**

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<td>NAC Ad Hoc ADS-B Report</td>
<td>NAC ADS-B Ad Hoc Task Group</td>
<td>June 2015</td>
<td>Yes</td>
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<td>NACSC Ad Hoc Metrics Group Report</td>
<td>NAC Subcommittee</td>
<td>June 2015</td>
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**Actions**

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<td>Briefing to NAC - status of actions related to ADS-B implementation, including the actions of the Equip 2020 initiative and the status of the elements recommended by the Ad Hoc. The FAA will also provide information to the NAC on benefits and fleet installation and identification of issues that require additional follow-up.</td>
<td>FAA, AVA/ANG/ATO</td>
<td>On-going /NAC meeting October 2015</td>
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<td>Presentation to the NAC related to space-based ADS-B deployment, oceanic surveillance and the common weather picture</td>
<td>FAA, AVS/ANG/ATO</td>
<td>October 2015</td>
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FAA Metrics | FAA, ANG | Report—plans October 2015
Industry Metrics | RTCA | Report-plans October 2015
Brief NACSC on access to SWIM data | FAA, ATO | July 2015
Communicate with airline CIO’s on DataComm Security Protections | FAA, ATO/AVS | September 2015
Briefing on NextGen Implementation Concept of Operations to include elements, benefits and timeframes | FAA, ANG | October 2015

DFO Closing Comments

Mr. Whitaker thanked the members for their participation in the meeting, and the continued work on the NIWG priorities and metrics.

Chairman Closing Comments

Mr. Anderson asked if the NAC should receive a briefing on the full picture of NextGen. This was added to the list of items for the upcoming meeting.

A Committee member shared an ad that was developed outlining a recent event providing important information on the implementation of the En route Automation Modernization (ERAM) program. The Committee also was presented a video featuring the DataComm program.

Other Business

Two committee members discussed the status of the DataComm mandate in Europe. The conclusion is that the timing of the US and European programs are not aligned, but the long-term concept of operations and capabilities are in sync.

Adjourn

By motion, Chairman Anderson concluded the meeting of the Committee at 2:55 p.m.

Next Meeting

The next meeting of the NAC is October 8, 2015 in Memphis, TN. Hosted by FedEx.
NAC Chair Report
Talking Points for Richard Anderson
Memphis, TN October 8, 2015

Opening

- I want to thank Mike Whitaker, Teri Bristol, Ed Bolton and their team at the FAA for their continued commitment to work in collaboration with the industry in the implementation of NextGen capabilities.

- As a result, we are seeing tangible results from the deployment of some of the capabilities we identified as top priorities. It has been one year since approval of by the NAC of the NextGen Integration Working Group final report and the subsequent NextGen Priorities Joint implementation Plan that the FAA presented to Congress. Collectively we have achieved many successes in meeting implementation milestones for fielding NextGen capabilities. The plans must be kept up to date, working towards the goal of not just implementation, but improvements in operational performance.

- The devil is in the details, and that is where we are now. We are in this together now so it is fortuitous that we can build on the bonds we have built over the past year to work TOGETHER to overcome unforeseen challenges and take advantage of unexpected opportunities. Let our mantra going forward be “no surprises”.

- While there are many interim programmatic and infrastructure milestones along the way for which all involved should receive due credit, until we move the needle on performance, we must remain diligent in our work together to see that all necessary components of each capability are achieved, such as training, decision support tools, procedures and policies.

Joint Implementation Plan

- From the start, there was a realization that there were stretch goals incorporated into the plan and many of these have been met or on the path to completion. In other cases, for numerous reasons, milestones have been delayed. It is time for the Teams to review...
the plans and modify as appropriate through the successful collaborative process. 
Through this transparent process, the teams will review the program milestones and decide together how to address issues.

- Through a series of interviews with key participants, the FAA conducted a review of the NAC prioritization and NextGen Integration Working Group process, resulting in an update to the existing plan and a path for maintaining the currency of the plan as well as an approach to establish this as a repeatable process - updating the plan on a 3-year rolling iteration.
- Moving ahead into year two, we will be implementing an intentional and structured process for on-going FAA-industry collaboration.
- Employing time honored, best program management and change management practices, any variances, whether delaying, accelerating or removing a milestone, must be fully vetted and tracked in an open and transparent manner on the NIWG. We stand ready to work with the FAA over the next few months to establish such a repeatable process.
- I want to reiterate the importance of the interdependencies among not only the four priority areas, but also how we integrate other capabilities in a way that makes the four priority areas more beneficial to the operation of the national airspace system. Implementing capabilities in one, while helpful, doesn’t always lead to the bigger benefits we are all seeking.
- It is also encouraging that the FAA is including near-term flow management capabilities into the PBN focus area.
- You will hear more about all of these points during our meeting today.

Evaluating Implementation

- This morning the Committee heard from our host at FedEx on benefits they are receiving from NextGen implementations.
- Specifically, Memphis has been a key site for implementing Wake Recategorization, a capability that provides a tremendous value in efficiency and capacity improvements.
The benefits noted highlight the importance of this capability, something that the NAC has encouraged the FAA to implement. The FAA has been responsive by expediting implementation, where possible.

- The FAA is showing its continued confidence in the NAC and with the outstanding collaboration between the FAA and the NAC with the new Tasking on Metrics that builds on the six metrics and methods for tracking performance improvements approved by the NAC at the last meeting. The FAA and the industry are working together to collaboratively analyze and report performance on the specific implementations.

- I want to caution that the purpose of this work is to evaluate the implementations, promote success and identify any obstacles to success that need to be addressed. It is not for political purposes – we must not politicize the NAC.

- Let me underscore the need for the Industry and the FAA to speak with one voice regarding the operational performance improvements attributable to NextGen implementation.

Closing

- I want to emphasize that the NAC is pleased and honored to be a venue for the important collaboration between the FAA and industry on implementing NextGen.

- In closing, thank you to all my colleagues on the Committee for being here today.

- Finally, thank you David Cunningham and Jim Bowman of FedEx for hosting the meeting.
Introduction

Thank you, Richard [Anderson, NAC Chairman]. Good morning, everyone.

It’s great to be here with you today, and I look forward to updating the Committee on important events since our last meeting in June.

David [Cunningham, FedEx Express Chief Operating Officer], our thanks go out to you and FedEx for hosting today's event.

FedEx has been supporting our efforts to demonstrate NextGen capabilities for many years, and we value that partnership. You’ve been leaders in Controller Pilot Data Link Communications, and a key participant in our efforts to enable Data Comm capabilities in the NAS. Wake RECAT was also born here, as FedEx likes to say, and we are all very excited about the benefits we are seeing with it.

We also heard this morning about the benefits of low-visibility capabilities like enhanced flight vision. The FAA continues to pursue a rulemaking on Enhanced Flight Vision Systems, which will help reduce our ground infrastructure requirements and lead to lower NAS maintenance costs. In fact, NASA is hosting a
workshop next week highlighting its research in this area, as well as a session on next steps for using flight vision technologies in a NextGen environment.

This type of interagency collaboration is important to the future of NextGen. That's why I'm pleased that we've added Dr. Jaiwon Shin [JAY-won Shin], Associate Administrator for NASA’s Aeronautics Research Mission Directorate, as a new member of the NAC. Dr. Shin sends his regrets that he couldn’t make today’s meeting, but he looks forward to working closely with the Committee in the future.

I also want to give a warm welcome to our other new NAC member: Jim Bowman, the Senior Vice President at FedEx, Flight Operations.

**FAA News**

Now before I get into the FAA’s NextGen report, I want to briefly update you on some of the most important issues currently facing the agency.
Reauthorization

First, I have to address one of the foremost topics on everyone’s mind: reauthorization.

As you all know, Congress passed a six-month extension of the FAA’s authority last week. This buys Congress some time to enact a longer-term bill. As part of that, there have been a lot of conversations happening on Capitol Hill about what a new FAA reauthorization should look like. We’re committed to working closely with Congress to pass a bill that embraces a few key principles.

- Reauthorization must help us maintain our exceptional safety record by providing more opportunities to use risk-based decision-making.

- It should strengthen America’s global leadership on aviation.

- It should allow us to continue to integrate new users in the NAS, and realign our airspace system with current demands.

- Reauthorization must provide further support for the modernization of our air traffic control system with stable funding for our core operations and NextGen investments.
As Congress works on a bill in the months ahead, discussions are likely to continue about the structure of the FAA and our air traffic operations. We’re open to having these conversations, but we must ensure that any potential changes under consideration provide long-term, stable funding for our air traffic operations and help us maintain the safest airspace system in the world.

Congress has approved a Continuing Resolution, or CR, to keep the government funded through December 11, and also approved a short-term extension of our authorization until March 31st, 2016. We’ll also continue to push for a long-term reauthorization bill. We don’t want a return to the days before our 2012 authorization, when we had 23 short-term extensions. We need a long-term bill that will provide stable, reliable funding for the critical projects we’re supporting and help us maintain America’s role as a global aviation leader.

Compliance Philosophy

Next, I’d like to update you on an announcement Administrator Huerta made earlier this week about the FAA’s new Compliance Philosophy.

It’s often said that America is the gold standard in aviation. One reason for this is the dramatic improvements we’ve made together on safety. In recent years,
our approach has matured to focus on identifying areas of risk and mitigating them before an incident occurs. As part of this shift to risk-based decision-making, our enforcement efforts are evolving as well.

The Compliance Philosophy cements in writing what much of the agency has been doing for quite some time. It’s based on open and transparent exchange of information and data between the FAA and industry.

Our goal is to have safe operators, not operators who inadvertently make a mistake and then hide it because they’re afraid of being punished. If there is a failing, whether human or mechanical, we want to know about it, learn from it, and make the changes necessary to prevent it from happening again.

By aiming for compliance with the standard first, we free up our inspectors to spend more time identifying and correcting problems, rather than putting together enforcement cases for unintentional infractions.

This doesn't mean we’re going to go easy on compliance, or ignore minor issues, or let anyone believe they have a free pass. We will continue to have zero tolerance for intentionally reckless behavior, repeat failures, or deviation from regulatory standards. We will continue to vigorously pursue enforcement action in these circumstances. In fact, earlier this week, the FAA proposed a $1.9 million civil penalty against a company that knowingly conducted dozens of unauthorized
flights with an unmanned aircraft over Chicago and New York for the purposes of aerial photography. This is the largest proposed civil penalty to date against an unmanned aircraft operator.

But in cases where we find flawed procedures, simple mistakes, a lack of understanding, or diminished skills, we will use tools like training or documented improvements to procedures to ensure compliance.

This approach recognizes that all aviation stakeholders have a vested interest in the safety of our system. That’s what Compliance Philosophy is all about.

Unmanned Aircraft

I’d also like to update you today on the actions the FAA is taking in one of the fastest changing areas of the aviation industry: unmanned aircraft.

Yesterday, I testified at a House Aviation Subcommittee hearing on our UAS efforts. [AD LIB IMPRESSIONS FROM HEARING. ½ PAGE SPACE FOR NOTES]
Integrating unmanned aircraft into our airspace is a big job, and it’s one the FAA is determined to get right. We recently filled two executive-level positions that are going to build on our momentum and help us accomplish this goal.

One of them is familiar to everyone in this room. Hoot Gibson, who worked with us very effectively in leading the Equip 2020 effort, has been chosen to serve as the FAA’s Senior Advisor on UAS Integration. He will focus on external outreach and education, as well as interagency initiatives.

As all of you know, Hoot is coming to us from the NextGen Institute, where he showed tremendous leadership as the Executive Director. With his departure and the substantial progress we’ve made on the Institute’s goals, the FAA will be
transitioning the NextGen Institute’s activities into the agency in the months ahead as we continue to work closely with industry through similar entities like RTCA.

We’ve also tapped Earl Lawrence as the Director of the UAS Integration Office within the FAA’s Aviation Safety organization. Earl previously served as the Manager of the FAA Small Airplane Directorate. In his new role, he’ll lead our efforts to safely and effectively integrate unmanned aircraft into our nation’s airspace.

Earlier this year, we took an important step forward on that goal by releasing a proposed rule that laid out a flexible framework for allowing the routine use of small unmanned aircraft. The FAA received more than 4,500 public comments on this proposal, and we’re working to address them before finalizing the rule.

This, however, is a lengthy process – so we’re simultaneously pursuing other ways to expand the use of unmanned aircraft.

We continue to receive valuable information from our six national test sites, and a team at Mississippi State University is now running the FAA’s Center of Excellence for Unmanned Aircraft Systems.

We’re starting to look into the role NextGen technologies like ADS-B could play in the integration of unmanned aircraft into our airspace.
We’ve accommodated more than 1,800 requests for commercial operations under our Section 333 exemption process.

We also launched the Pathfinder Program, a public-private partnership that will help us determine how we might be able to safely expand unmanned aircraft operations beyond the parameters of our proposed rule.

Finally, as unmanned aircraft have become more popular, the FAA is stepping up to educate the public on how to safely and responsibly operate these devices.

We have an ongoing, nationwide “No Drone Zone” campaign, which most recently focused on reminding people to leave their unmanned aircraft at home during the Papal visit in Philadelphia, New York, and Washington, D.C.

We are also involved in an active partnership with industry stakeholders called “Know Before You Fly.” This effort by government and private partners works to provide UAS operators with up-to-date information and the guidance they need to fly safely.

All of these efforts are part of our commitment to the safety of our airspace as the unmanned aircraft industry continues to grow and evolve.
NextGen Progress

Now, I’d like to move on and share some recent highlights from our work implementing NextGen.

Infrastructure Progress

As I detailed at our last meeting, the FAA has made tremendous progress on building the infrastructure that supports all of our NextGen capabilities.

ERAM is now installed and operational at all 20 of our planned en route control centers. We’ve finished the coast-to-coast installation of the ADS-B network, and ADS-B is integrated at all of our en route centers. And last month, we took a big step forward on Data Communications, one of our key NextGen technologies and one of our four NextGen priority focus areas.

We reached initial operating capability for Data Comm’s departure clearance services at our three key site towers: Salt Lake City, and both Houston airports.
These sites are in addition to the highly successful Data Comm trials that we implemented at Newark and here in Memphis.

This is an exciting milestone, and there are many people who deserve credit for getting us to this point. Everyone at the Salt Lake, Bush, and Hobby control towers, as well as at the Salt Lake, Houston, and Atlanta Air Route Traffic Control Centers, worked hard to install, test, train on, and manage this capability. Our labor partners at both the national and local facility levels also made invaluable contributions to accomplishing this milestone.

Additionally, I have to thank our industry partners, including FedEx, Southwest, United, and UPS, who provided dedicated flight crews so we could test this new capability prior to Data Comm activation at these three airports. We’re also working closely with the Air Force, which has an air national guard base at Salt Lake International – a terrific example of cross-governmental teamwork.

As we continue to roll out these new NextGen technologies, we also experience the occasional glitch – as we did with ERAM at the Washington Air Route Traffic Control Center in August. I’ve asked Teri Bristol, our Chief Operating Officer at the FAA’s Air Traffic Organization, to update the group on that incident, as well as our cyber security strategy for Data Comm.
Priorities Progress

Thank you for that update, Teri.

Now, I’d like to provide a brief update on our priority areas, which we all believe will provide the most significant NextGen benefits in the near-term. Thanks to the work the FAA has done in partnership with this Committee, we have been successful in delivering on these priorities together.

In fact, over the past year, we have implemented wake recategorization at numerous locations. We have implemented new performance based navigation procedures. We have published national standards. We have improved data sharing. We have also used the results of our studies and assessments to identify additional next steps for work that is important to industry.

Most recently, as I mentioned, we completed implementation of our first Data Comm key sites. Starting next year, we’re aiming to deploy Data Comm in more than 50 of our air traffic control towers.
We’ve made significant progress in surface operations and data sharing this summer thanks to industry leadership. They’ve brought in airport operators to the collaborative decision-making process, and they’ve made sure that all users have real-time air traffic control and flight movement information to manage air operations more effectively.

Industry has also worked closely with the FAA to simplify the application process for System Wide Information Management data – a much-needed improvement in our ability to access this important information.

I continue to be impressed with the collaborative work at the subcommittee level and among the NextGen Integration Working Group leadership as well.

Over the last few months, we interviewed more than 20 industry and FAA leaders who were involved in the effort to set priorities over the last year. You will hear the highlights from those interviews this morning – the feedback was overwhelmingly positive.

As a result, the NextGen Integration Working Group leaders have been talking about how we can move forward and ensure our plan remains current and relevant to our ever-changing industry.
While we’ve had a successful year, this is only the beginning. We want to maximize our NextGen capabilities and the benefits we’re delivering, and we continue to make progress on our efforts to measure these impacts.

The FAA and industry leads for the NextGen Priorities will be providing updates on our milestones later this morning, and I know we are all looking forward to their report.

**Today’s Agenda**

We’ve got a number of other interesting topics on the agenda for today.

While we’re all very focused on the priorities outlined in our Joint Implementation Plan, NextGen is more than just these four focus areas. Following up on a request made at the last NAC, Paul Fontaine is going to provide a high-level overview of the full scope of our NextGen capabilities. With some new NAC members joining us, this is a good opportunity to review the overall breadth of our NextGen plans.

We’ll also be delivering on an IOU from our last NAC meeting by providing an update on ADS-B equipage progress and trends. John Hickey has our team ready to brief you today on where we are with the key issues the Equip 2020 team
is working on. Equipage rates are increasing, but as you will see, we still have a lot of hard work to do to ensure we make that important 2020 deadline.

With Hoot Gibson’s move to my office to lead our UAS outreach efforts, I want to reiterate the FAA’s commitment to supporting Equip 2020. Quarterly meetings will be held as planned, and we will continue to provide logistics and technical support.

We all know what important work this group is doing – and we’re not the only ones. Last week, we received word that the Air Traffic Control Association will be presenting the Chairman’s Citation of Merit Award to the Equip 2020 team at their annual conference next month. This recognition would not have been possible without your participation and leadership, so thank you and congratulations.

I also want to thank all of our industry partners for their work promoting ADS-B equipage. I am confident that aligning our messaging – like we did with the NextGen Institute, AOPA, GAMA, and the Aircraft Electronics Association at the FAA Safety Center in Oshkosh this year – will deliver the results we’re after.

Jim Linney and Bruce DeCleene will also provide an ADS-B surveillance roadmap, including:
• The status of the ground infrastructure and airborne equipage activity for ADS-B Out;

• The definition and status of initial applications for ADS-B In; and

• Proposed future ADS-B In applications.

Jim will also cover the FAA’s work on space-based ADS-B and our progress toward a common weather picture.

Additionally, you’ll have the opportunity to hear from Mark Bradley on our work to formulate a new PBN Strategy. At the FAA’s request, the PARC kicked off a technical review of this PBN Strategy document in August. They’ve identified two non-technical areas where they would like support from this Committee. Not surprisingly, one of those areas is traffic flow.

Traffic flow management is essential to optimizing the flow of aircraft as they approach and depart congested airspace. The FAA has been working on this issue using Time Based Flow Management, or TBFM.

We’re on target to publish a set of national procedures this December that includes a policy for the use of TBFM to support PBN implementation. We’ve conducted an in-depth study on the soft skills and culture changes that will be necessary to make TBFM a success. We held our first TBFM Customer Forum in
August, and we’ll be holding discussions on how to measure TBFM performance and activities going forward.

While the importance of flow management and its associated automation capabilities are well known, the PARC agreed that additional focus from the NAC in this area is needed.

**Community Engagement on Noise**

Finally, we can’t discuss PBN without also engaging on the issue of noise.

There are now more satellite-based procedures than conventional procedures in our skies, and the vast majority of PBN procedures have been implemented seamlessly and without controversy.

Over the last two decades, we’ve made significant progress in reducing the noise footprint for people living around airports. This has been accomplished with advances in aircraft technology, operational procedures, and programs to work with airports to mitigate noise.

But as individual aircraft noise levels have decreased, we’ve seen increases in the number of operations, particularly during nighttime hours, and in the number of people living around airports. Our procedural actions as we implement NextGen
also sometimes result in changing flight patterns and noise for communities around airports.

As a result, we’ve seen an increasing level of public debate, political interest, and even litigation related to aircraft noise. Given these trends, the FAA’s engagement with communities is more important than ever.

Efforts are already under way within the FAA to improve our ability to interact with communities on noise issues in ways that are transparent, inclusive, responsive, and productive. We're committed to being smart and thoughtful about educating, involving, and getting input from residents – building on good past practices and using new techniques, including social media.

In Southern California, for example, we just today closed an unprecedented 120-day public comment period for the Southern California Metroplex Draft Environmental Assessment. We’ve held more than twice as many public workshops as we have for any other Metroplex project. And we’ve made a number of online tools available that let residents look up noise levels for their communities and see current and proposed flight tracks on Google Earth maps.

We’re also conducting early outreach to airport authorities to help us identify local environmental sensitivities and improve decision-making. Additionally, we are starting to introduce environmental considerations earlier in
the procedural design process to better understand interdependencies and consequences.

    But this issue won’t be solved by the FAA alone. We need to work together to ensure that NextGen enhancements are successful and provide a sustainable environment for underlying communities.

    We all have to lean in.

    We need the entire aviation industry to work with us on engaging communities, getting them comfortable with proposed changes, and explaining the capacity and efficiency benefits of new procedures.

    By working together, we can make sure NextGen has a net positive impact for everyone.

**Conclusion**

    Thank you for the opportunity to address you today. This concludes the FAA report.