Meeting Summary, March 14, 2018

NextGen Advisory Committee (NAC)

The twenty-third meeting of the NextGen Advisory Committee (NAC) was held on March 14 at Harris Corporation in Palm Bay, FL. The meeting discussions are summarized below and the presentation (Attachment 1) for the meeting contains much of the detail on the content covered during the meeting.

List of attachments:

- Attachment 1 – Presentations for the Committee meeting
- Attachment 2 – List of Attendees – Committee members and general public
- Attachment 3 - October 4, 2017 NAC Meeting Summary
- Attachment 4 – NAC Chairman Bronczek Report
- Attachment 5 – FAA Report/Designated Federal Officer remarks
- Attachment 6 – Priorities for Improving Operational Performance in the Northeast Corridor through CY2021 Report

Welcome and Introduction

NAC Chair Dave Bronczek, President & COO, FedEx Corporation, began the meeting at 9 a.m., thanking Ed Zoiss and the Harris team for hosting the event and welcoming the committee members and others in attendance (Attachment 2). He emphasized the importance of the Committee members participation and the opportunity, “to have their voice heard”.

Designated Federal Officer Statement (DFO)

DFO Dan Elwell, FAA Acting Administrator, presented the Federal Advisory Committee Act notice that governs public meetings.

Review and Approval of October 4, 2017 Meeting Summary

Chairman Bronczek asked for and received approval of the summary from the October 4, 2017 meeting. (Attachment 3)

Chairman’s Report

In his remarks (Attachment 4), Chairman Bronczek emphasized the huge potential benefits of modernizing air transportation (NextGen) in the Northeast Corridor (NEC). The benefits are
critical because the delays in the NEC account for nearly half of all delays in the entire National Airspace System (NAS) and making improvements would help the entire system. He reinforced that airlines and airports have made and continue to make billions of dollars in investments at key NEC airports to serve the needs of the travelling public. He also challenged committee members to make the commitments by both industry and the FAA necessary, to advance the NEC on ten industry priorities designed for implementation in 2019-2021. Chairman Bronczek thanked everyone for their commitment to implement NextGen, reinforcing that consensus among the industry must continue for success – whether addressing policies, strategies for implementations or improving daily operations.

**FAA Report**

Mr. Elwell provided comments (Attachment 5) covering FAA’s proposed budget, the Reauthorization status and the following:

- **Enhanced Surveillance of Oceanic Airspace** – The FAA is fundamentally supportive of the NAC recommendation that this be done via satellite Automatic Dependent Surveillance-Broadcast (ADS-B), however the FAA needs to make their business case. He emphasized that operators must have “skin in the game”, and information will be provided to the NAC Subcommittee (NACSC) in April 2018.

- **State of Performance Based Navigation (PBN)** – The FAA is re-evaluating active projects: their schedules, budgets, available resources, and potential benefits and risks. The FAA will report back to the NAC in June 2018 on the results of the evaluation.

- **FAA Staffing** – Teri Bristol, FAA’s COO, Air Traffic Organization (ATO), reported on the hiring and training initiatives for the New York area facilities, and the specific challenges associated with the complex high-density airspace and the high cost of living in the New York area.

**Discussion:**

Several committee members expressed encouragement about the FAA’s efforts and offered their support to assist them in improving the staffing situation. Members of the committee encouraged transparency on the staffing issue. In response to a request from Chairman Bronczek, Ms. Bristol committed to provide a synopsis on the staffing situation in the NEC for distribution to the Airlines for America (A4A) board members, and the members of the NAC. Ms. Bristol also commented that 2018 is a challenging year because of staffing levels, but expects the situation will improve over the next 18 months.

Another committee member also commented that airlines have similar challenges, attracting, hiring and attaining pilots and crew members in the NEC. It was suggested that controllers managing traffic is a top priority and working on changes to the air
traffic procedures and implementing new tools should follow. It was also noted that the airlines worked closely with the Transportation Security Administration in a systematic way to help address issues with their checkpoint staffing. This type of approach to problem solving is something the industry wants to use in support of the FAA.

In continuing his report, Mr. Elwell discussed:

- ADS-B Out – The ADS-B mandate compliance date is not changing, and operators are requested to provide updated compliance plans to MITRE by May 15. The FAA will provide an update on progress at the June NAC meeting.
- In closing, he stated that safety, innovation, and infrastructure are achieved through collaboration, and the NAC, the NACSC, and the Working Groups are making good progress.

**Outcome:**

- PBN Review – The FAA is evaluating budgetary constraints and prioritization for single-site implementations and establishing plans for the future to report at the June 2018 NAC meeting.
- NEC FAA Staffing – ATO will provide an FAA staffing update for distribution to A4A and the NAC by April 2018.
- ADS-B Out – Air Carriers will file compliance plans by May 15 with MITRE, and an analysis of ADS-B equipage will be presented at the June 2018 NAC meeting.

**Improving Operational Performance in the NEC**

NEC Co-Chair Warren Christie, Senior Vice President, Safety, Security and Air Operations, JetBlue, presented ten industry priorities designed for implementation in 2019-2021. These are designed to address the NEC, which encompasses airports and airspace stretching from Washington, DC to Boston. The purpose of the initiative is to improve:

- Deconflicting airports;
- Enhancing airport and airspace throughput; and the
- Balancing of demand and capacity in NEC traffic flow

He also mentioned leveraging data to improve traffic flow management decisions.

**Discussion:**

A committee member observed that aircraft operators need to better leverage Required Navigation Performance (RNP). There may be more potential at selected sites such as JFK runway 13L as a NextGen runway, or to consider locations outside of the NEC, such as
Nashville, Saint Louis, or Kansas City, to determine what could be achieved from NextGen, and apply it in the NEC. This was referred to as a “NextGen Airport”. Others cautioned against that approach because it could detract resources from the NEC priority. It was noted that the NEC is the “main thing”, while another member emphasized the importance of selecting an airport location in the NEC for implementing a subset of NextGen capabilities.

The committee also discussed Navigation (NAV) equipage and what levels are needed to leverage benefits from RNP. Mixed equipage was pointed to as the biggest issue needing to be addressed in applying NextGen at an airport, and the lowest common denominator of capability tends to drive the scope of operations. One member commented that critical mass for NAV equipage is important wherever a NextGen Airport is implemented. Another member stated that there is a need to identify how to get past this issue of reconciling various levels of NAV equipage. It was also noted that determining how benefits accrue is essential for considering a NextGen airport.

The final commenter pointed out the need to take a holistic approach that considers physical constraints at airports (surface constraints are significant), airspace, controller tools and improving aircraft capabilities as fleets continue to be modernized through new deliveries.

Outcome:

- Approval of Recommendation: Priorities for Improving Operational Performance in the Northeast Corridor through CY2021 (Attachment 6).
- Requested response on the NextGen Airport concept.

NextGen Integration Working Group (NIWG) Update – Near-Term Implementations

Co-Chair Melissa Rudinger, Vice President, Government Affairs, Aircraft Owners and Pilots Association (AOPA), led the discussion from the Four Priority Teams working on implementations of DataComm, Multiple Runway Operations (MRO), Performance Based Navigation (PBN) and Surface and Data Sharing, along with the NEC. In addition to overseeing the implementation of current plans, the teams are also developing the Rolling Plan for Implementation in 2019-2021.

Northeast Corridor

FAA Subject Matter Expert (SME) Dave Foyle, FAA ATO, provided an update on the implementation underway at Philadelphia International Airport and the augmentation of airspace in the off-shore airspace adjacent to New York.

DataComm

Chuck Stewart, Chief Technical Pilot, Communications, United Airlines and Malcolm Andrews, Director Enterprise Services, FAA, provided the briefing on DataComm. Mr. Stewart explained industry concerns over potential FAA delays in the EnRoute DataComm waterfall for initial services because of the staffing constraints. This delay is of concern because of the
benefits operators anticipate from DataComm. Operators are strongly supportive of DataComm and are concerned with the delay’s impact on operator training timelines and the delivery of safety enhancements and operational benefits. Ms. Bristol responded that the FAA is evaluating staffing constraints and will report back to the NACSC at the April 2018 meeting.

Discussion:
A committee member expressed concern about the shortage of FAA staff adversely affecting the implementation of NextGen and offered the NAC as a resource to support the FAA in obtaining needed resources. Another member stated that operators strongly support the DataComm program and wants to assist the FAA.

Chairman Bronczek also noted that the next NAC meeting will concentrate on the NEC. The NIWG reports will be provided in advance for the Committee members to review in preparation for discussion at the meeting.

Outcome:
- The NACSC will receive a report from the FAA on its assessment of staffing constraints on the EnRoute DataComm waterfall for initial services.
- Reports of the NIWG teams will be provided in advance to the NAC, with only the highlight for discussion being covered at the meeting.

The Committee also received reports from the remaining NIWG teams.

Multiple Runway Operations
Glenn Morse, Director of Industry Affairs, Network Operations Control, United Airlines, Jon Tree, Director of Aviation Regulatory Standards, Jeppesen/Boeing, and Paul Strande, Manager, FAA-ANG, provided an overview of the implementation of Wake Recategorization (ReCat).

Discussion:
Chairman Bronczek noted that Wake ReCat works well at Memphis International Airport.

Performance Based Navigation
Steve Fulton, VP Sales & Marketing, Sandel Avionics, reviewed the outcome of a NAC action item on Vertical Navigation Capabilities in certain aircraft (primarily regional aircraft), with a request for the FAA’s Performance-based Operations Rulemaking Committee (PARC) to evaluate mitigations. He also stressed the importance of PBN to be considered as an infrastructure program as the Team develops recommendations for the future.

Surface and Data Sharing
Rob Goldman, Senior Manager, ATM, Delta Air Lines, and Mike Huffman, Terminal Flight Data Manager (TFDM) Program Manager, FAA ATO, explained the importance of data
sharing initiatives that are foundational for Trajectory Based-Operations. It was also noted that operators will be asked to share additional data as the FAA moves to implement its comprehensive surface management TFDM program.

**Surveillance Equipage Status**

**FAA:** Jim Viola, Acting Deputy Associate Administrator, Aviation Safety, FAA, reviewed the status of ADS-B Surveillance Equipage that is lagging below the levels the agency projects is necessary to achieve compliance. He asked that the industry commit to provide data on their compliance plans by May 15 to meet the January 1, 2020 deadline for equipping with ADS-B. The NAC members have previously agreed to meet the 1/2020 date, and during the meeting, Chairman Bronczek affirmed that all the members of A4A are committed to equip by the deadline.

**AOPA:** Ms. Rudinger reported on the challenges the owners of light general aviation (GA) are having as the deadline for ADS-B approaches. Based on the outreach and surveys conducted by AOPA, cost and the lack of benefits are the biggest barriers to GA equipage. Ms. Rudinger requested that the FAA resume its GA ADS-B equipage rebate program.

**Discussion:**

A NAC member noted that capacity is limited for GA installers, and the rebate program would help move light aircraft owners to equip. Another commented that many new aircraft are equipped by the factory, and an avionics producer explained that manufacturers meeting the demand and supply of the equipment should not be an issue. An airline representative in the audience stated that older aircraft (not compliant with the ADS-B mandate) are planned to be retired from their fleet prior to the January 2020 deadline.

**Outcome:**

- Aircraft operators will provide compliance plans by May 15 with MITRE and an analysis will be presented at the June 2018 NAC meeting.
- FAA will consider resuming the GA rebate program.

**American Airlines:** Ron Thomas, Managing Director Flight Operations, American Airlines, provided background on the decision they made to equip some of the airline’s Airbus aircraft with an ADS-B In capability. The benefits case for the equipage decision is based on higher achievable throughput; decreased spacing buffer; increased pilot situational awareness, less delay on vectoring; and reduced missed approaches. Mr. Thomas ended his presentation with a request for support of ADS-B In initiatives.

**Discussion:**

Mr. Elwell stated that since the separation is by aircraft pairings that are ADS-B equipped, the outcome will be related to the number of aircraft equipped with ADS-B Out.
A committee member also noted that the industry collects $14.9B from passengers to support the FAA operations, which is important to consider as the FAA evaluates the future of Enhanced Surveillance in Oceanic Airspace.

**Drone Advisory Committee (DAC)**

Mr. Elwell, DFO for the DAC, gave an overview of the recent March 8 meeting. One of the points he emphasized was the value of discussion by the committee members. The FAA engaged the DAC members in conversations that were helpful to the agency as it formulates policy.

He expressed that a similar format could be helpful with the NAC. The principle is:

- Opening topics for collective robust dialogue and disposition during the meeting through active dialogue
- Topics for discussion that may require white papers and interim work in advance of subsequent meetings
- Topics for taskings to the NACSC / develop a working group to address longer range items

**Summary of Action Items and Next Steps**

Andy Cebula, NAC Secretary, RTCA, reviewed the following:

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Responsible Entity</th>
<th>Source of Action</th>
<th>Completion Date</th>
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</table>
| 1           | FAA/RTCA         | NAC February 2017 | March 2018 Approved Industry Priorities
|             |                   | FAA Letter April 2017 | Due: June 2018 – Implementation plans for 2019-2021
|             |                   | NextGen Airport concept | Equipage impacts, incentives, critical mass for success
|             |                   | NextGen Airport concept | NextGen Airport concept
| 2           | FAA/RTCA         | NAC October 2017 | December 2017 NACSC report/discussion
|             |                   | March 2018 Report | March 2018 Report
|             |                   | April 2018 - ATO provide FAA staffing update for distribution to A4A and NAC | April 2018 - ATO provide FAA staffing update for distribution to A4A and NAC
<table>
<thead>
<tr>
<th>#</th>
<th>Task Description</th>
<th>Responsible Party</th>
<th>Date/Document</th>
<th>Notes/Actions</th>
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<tbody>
<tr>
<td>4</td>
<td>EnRoute DataComm waterfall for initial services-FAA evaluation of staffing constraints</td>
<td>FAA</td>
<td>NAC March 2018</td>
<td>Report to NACSC April 2018</td>
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<td>5</td>
<td>Equipage – Using inventory of aircraft fleet (on-going initiative) including PBN NAV capability for regional and mainline aircraft and use information to complete assessment of VNAV concern effects on PBN Milestones including those related to Established on RNP and develop recommendation for NAC.</td>
<td>RTCA-NACSC</td>
<td>NAC June 2017</td>
<td>C/N/S Equipage&lt;br&gt;NACSC On-going&lt;br&gt;March 2018 VNAV action requested of Performance-based Operations Rulemaking Committee (PARC)&lt;br&gt;PBN Milestones NIWG June 2018</td>
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<td>6</td>
<td>PBN Review – FAA evaluating budgetary constraints and prioritization for single site implementations and establishing plans for the future</td>
<td>FAA</td>
<td>NAC March 2018</td>
<td>June 2018 NAC meeting</td>
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<td></td>
<td><strong>Existing/On-Going</strong></td>
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<td>7</td>
<td>ADS-B Out Equip 2020 updates – standing agenda item for update on operator equipage AOPA requests FAA consider resuming GA rebate program</td>
<td>RTCA/FAA AVS</td>
<td>NAC February 2015</td>
<td>On-going future NAC meetings&lt;br&gt;Air Carriers file compliance plans by May 15 with MITRE; analysis to be presented June 2018 NAC meeting</td>
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</tbody>
</table>
| 8  | NextGen Integration Working Groups Joint Implementation Teams:  
|    | • DataComm  
|    | • Multiple Runway Operations  
|    | • Performance Based Navigation  
|    | • Surface & Data Sharing | RTCA/FAA | NAC February 2014 | On-going future NAC meetings - Tracking implementations of existing plan  
|    |                         |          |                  | Development of Rolling Plan Updates (2019-2021) due June 2018 NAC meeting  
|    |                         |          |                  | Distribute comprehensive materials in advance |
| 9  | Joint Analysis Team – evaluation of NEC implementations—baseline and post implementation | RTCA/FAA | Initial JAT creation FAA letter, August 2015  
|    |                                           |          | FAA Letter, April 2017 | March 2018  
|    |                                           |          |                  | Future deliverable dates TBD |

RTCA provided the meeting dates for 2018:

- June 28 - The MITRE Corporation, McLean, VA  
- October 11 - TBD

**DFO Closing Remarks**

Mr. Elwell thanked the Committee for all their efforts and participation. He stated that the discussion on the NEC was good. In addition to equipage plans, the FAA wants NAC input on what needs to be done with non-compliant aircraft in rule-airspace. He reinforced the nine years of the best safety record, acknowledging that the FAA is only one part, and cannot do it without all the industry. He continued that FAA reform is “not on the table”, but issues remain, and all would agree the FAA has funding and structural issues. They are looking at ways to accomplish what Chairman Shuster was trying to achieve.

He explained the pressure from drones and commercial space to address their emerging needs and expressed the need for NAC assistance with NextGen and getting legacy users through the system more efficiently.

**Chairman Closing Comments**

Chairman Bronczek thanked everyone for coming and participating.

**Adjourn**
Chairman Bronczek ended the meeting at 12:25.
Welcome to the Meeting of the NextGen Advisory Committee

March 14, 2018
Harris Corporation
Palm Bay, FL
Welcome & Introductions
In accordance with the Federal Advisory Committee Act, this Advisory Committee meeting is OPEN TO THE PUBLIC.

Notice of the meeting was Issued on January 12, 2018 and published in the Federal Register on:

January 26, 2018

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:
October 4, 2017 – Meeting Summary
Chairman’s Report
David Bronczek, NAC Chair
NAC Agenda Topics

- FAA Report
- NextGen Priorities Status – NextGen Integration Working Group: Northeast Corridor Phase Two
- NextGen Priorities Status – NextGen Integration Working Group: Four Priority Areas Milestone Reports
- Comm/Nav/Surveillance Equipage Status
- Drone Advisory Committee Report
FAA Report
NextGen Advisory Committee
Priorities for Improving Operational Performance in the NEC

Co-Chairs:
Steve Brown, NBAA
Warren Christie, JetBlue

Lead SME:
Mark Hopkins, Delta
NEC NIWG – Overview

- NEC NIWG: 110 individuals from 34 organizations
- Today: industry priority for operational needs in the Northeast Corridor
  - Milestones to address needs in June NAC meeting
- Measurement of impact begins late 2018
Industry Operational Needs in NEC
(March 2019 to December 2021)

Deconflict Airports to Improve Throughput

- Constrained NEC departure routes
- Loss of throughput arriving LGA 13 or 31
- Arrival throughput/GDPs at EWR
- Satellite airport access to NY area airspace

Grow Throughput

- Full utilization of available LGA capacity
- Improve JFK runway usage and delay
- Improve PHL runway usage and delay
- Reduced separation and spacing

Leverage Data to Improve Traffic Flow Management Decisions

- Evolve traffic flow management to leverage big data analytics for decisions
Benefits

- Primary benefit from addressing operational needs is airport and airspace **THROUGHPUT**
  - Better utilization of available throughput
  - Growing achievable throughput

- Leads to benefits on key operational metrics
  - Completion factor
  - Delay
  - Predictability
  - Block times
Implementation Risks

Risks and challenges to addressing operational needs in the NEC include (but not limited to):

- Physical limitations of airspace and traffic
- Funding and budget priorities
- Controller and support staffing and resources
- Mixed equipage of aircraft
- Environmental concerns
- Change management
Considerations for Establishing Milestones

Advancing RNP: balance between leverage existing capabilities and encouraging migration to PBN
  • NIWG identified need for data on feasibility of Advanced RNP in mixed equipage environment and the benefits case

iTBO: NEC prioritized for initial TBO implementation (now through 2022)

Community involvement: communication and engagement with local communities

Airport Investment priorities: specific investment plans and priorities for airport authorities in NEC
## Advanced Technologies

- **Objective:** merits of advanced technologies for NEC
- **Industry recommendations included for 4 technologies:**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Timing of Benefit</th>
<th>Synopsis of Recommendations</th>
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<tbody>
<tr>
<td>Ground Based Augmentation System (GBAS)</td>
<td>Near term</td>
<td>• Retain support&lt;br&gt;• Cat II approval for Cat I system&lt;br&gt;• FAA/airport/industry collaboration for use&lt;br&gt;• Support future investments in Cat III</td>
</tr>
<tr>
<td>Enhanced Flight Vision System (EFVS)</td>
<td>Longer term</td>
<td>• Request to study benefits and impact of mixed EFVS equipage</td>
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<tr>
<td>Cockpit Display Traffic Information (CDTI)</td>
<td>Possibility for nearer term benefits</td>
<td>• Accelerate development of operational criteria for use</td>
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<tr>
<td>Assisted Pilot Procedures (CAPP)</td>
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<tr>
<td>Flight Interval Management (FIM)</td>
<td>Longer term</td>
<td>• Review cost-benefit of ongoing FIM demonstrations&lt;br&gt;• NEC specific benefits study</td>
</tr>
</tbody>
</table>
To realize NextGen in the NEC, and fully address the challenges we face, stakeholders must synchronize critical, parallel investment efforts.
DISCUSSION
and
Consideration for approval of
Final Report
BACKUP DETAIL
Deconfliction & Throughput Focus

• Improvement for constrained NEC departure routes - during normal and severe weather operations
• Address loss of airport throughput due to airport/airspace interactions when arriving LGA 13
• Address loss of airport throughput due to airport/airspace interactions when arriving LGA 31
• Improvement in arrival throughput at EWR and delay reduction (i.e. Ground Delay Programs)
• Provide satellite airport access to NY area airspace and deconflicting satellite operations with the major airports where possible

Throughput/Growth Focused

• Provide full utilization of available LGA capacity
• Improvement of JFK runway usage and delay reduction
• Improvement of PHL runway usage and delay reduction
• Provide reduced separation and spacing and improved access to NEC airports

Data Driven Traffic Flow Management

• Evolve TFM to incorporate data-driven decision-making to better manage demand/capacity imbalance in the NEC
Industry Proposed Initiatives for NEC
(March 2019 to December 2021)

Industry offered perspective on specific initiatives to sequence first to address operational needs:

### Data Driven TFM
- Collaborative SOP around currently developed capabilities (IDRP, RAPT, NOD w DRS) for use during SWAP 2018
- Emerging applications and capabilities for opportunities within iTBO scope/waterfall for 2018+

### Multiple Airport Deconfliction
- RNAV transition to ILS LGA13, and RNAV LPV, RNP and/or GLS to LGA13
- Modified LGA/EWR airspace to deconflict EWR29 GPS, and new GPS and RNP approach
- Multiple PBN approaches for LGA31, including RNAV (GPS) transitions to existing procedures and exploitation of RNAV to LOC RWY 31

### Crosscutting Departure Throughput
- PDRR with technology and process changes in place
- Expanded low altitude and escape route structure
- Enhanced management for fix/route closure during irregular ops
- ZDC09 (MAP changes, splitting sector)
- Vertical climb escape route/high performance escape route
- ACRP and ZNY offshore routes
- TBFM metering and pre-scheduling

### Metro NY Airport Throughput and Efficiency
- Existing tools/investments to increase airport throughput: CRDA for JFK, high-speed turn-offs at EWR
- Existing PBN procedures modified as needed to increase use, reduce pilot and controller workload
- Tools to assist managing final approach spacing (CRDA, ATPA)

**LaGuardia**
- Dispersal headings (TNNIS, NTHNS, GLDMN)

**Kennedy**
- EoR for 13R
- ROBER OPD to 22L

**Teterboro**
- RNAV SID TEB19
- RNAV app procedures for TEB19 and TEB24

**Newark**
- 22L and 29 arrivals
- 4L visuals

Intended to be a cohesive plan in which all items are addressed
- Assumes that T+18 milestones are proceeding and are unaffected
- Multiple initiatives noted above are expected to begin with feasibility assessments
Objective - advise the NEC NIWG about the merits of any advanced technologies for additional studies of operational consideration in the NEC recommendations.

8 Meetings

Broad Operator Participation/FAA SME Engagement

Recommendations based on industry commitments and investments
Ground Based Augmentation System (GBAS)

Summary: Allows precision approaches where none are currently available

Recommendations for FAA:

• Retain current level of support per PBN NAS Nav Strategy
• Support GLS Cat II operational approval for a Cat I system and leverage GBAS adverse all-weather capability.
• Study GLS options for noise abatement in the NEC by using higher GP angles not to exceed Autoland limitations.
• Partner with Airports and Industry in NEC to support training and advanced procedure development as more aircraft are equipped to take advantage of capability.
• Support future industry investments in GLS Cat III capability if/when needed.
Enhanced Flight Vision System (EFVS)

**Summary:** Provides operational credit to lower required visibility/RVR minima on instrument approaches and significantly increases situational awareness during low visibility operations.

**Recommendations for FAA:**

- Complete benefits studies to determine requirements for reaching Cat II/III equivalent operations in the NEC. These studies should include the relative advantages to primary and secondary airports and how often arrival rates would improve if these benefits did exist.

- Complete studies to analyze the effects of mixed EFVS equipage aircraft operations in the NEC, including determining what level of equipage is required to begin realizing significant benefit. As EFVS installation is completely dependent on the operator, these studies will help define benefits for each specific carrier’s operations, as well as the potential timeframe to achieve immediate return on the investment.
Cockpit Display of Traffic Information (CDTI) Assisted Pilot Procedures (CAPP)

Summary: Involves enhanced Traffic Collision Avoidance System (TCAS) using ADS-B-in data that enable pilots to adhere to a controller’s clearance without visual acquisition and include technology that’s replaces the pilot’s view to acquire traffic to follow.

Recommendations for FAA:

- Accelerate the development of operational criteria for the CAPP use, including conducting studies to determine lead/follow requirements, controller requirements, and defining the conditions under which CAPP procedure is allowable.
Flight Interval Management (FIM)

- **Summary:** Uses ADS-B IN traffic information to provide speed cues to pilots to manage inter-arrival spacing.

- **Recommendations for FAA:**
  
  - With industry conduct a review of the results of 2018-2019 FIM demonstrations, including the cost and benefits, prior to the FAA’s final investment decision. The review determines the final status of future recommendation on IM development & implementation.

  - Conduct a NEC-specific benefit study (including safety cases, demonstration data, etc.). This study should be followed by presentations for FAA and Industry Executive leadership, creating a critically important collective commitment and close the business case. The FAA should simultaneously clarify policy roles and responsibilities.
Example: NEC Airport Priorities: PHL

27R departure queue taxiway

Additional 27L high-speed exit

PI=pre-implementation (airport development planning)
### JAT Measurement Plan Complete for Initiatives through Mar 31 2019

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Initial Ops Availability</th>
<th>Supporting Org.</th>
<th>Study Periods*</th>
<th>Benefits Assessment*</th>
</tr>
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<tbody>
<tr>
<td>Implement TBFM IDAC at 4 NY Towers</td>
<td>Q1 2018</td>
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<tr>
<td>Implement BOS SWIM Visualization Tool at ZBW</td>
<td>Q2 2018</td>
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<tr>
<td>Improve airborne metering to PHL**</td>
<td>Q1 2019</td>
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<td>Expand consistent usage of defined and existing capping and tunneling for departures/arrivals to/from the NEC through required advisories</td>
<td>Q1 2019</td>
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<tr>
<td>Implement TBFM Pre-Departure Scheduling at selected airport</td>
<td>Q1 2019</td>
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* May need to be adjusted based on the actual initial ops availability date and data availability; analysis of baseline performance will be conducted and reported on prior to the preliminary reporting

** May need to compare 2017 to 2019 study periods to eliminate periods with inconsistent use of metering
Staffing

Industry members of the NEC NIWG recently asked themselves the question: **is there more the NEC NIWG should/could be doing with the NAC’s support to positively impact the staffing challenges in the NAS?**

Staffing challenges are a fundamental impact to efforts to improve performance in the NEC, affects what can be implemented

Endorse FAA initiatives on staffing, Academy and specific location training

Given the assumption that the facility (N90) stays where it is, N90 and other NY facilities cannot adequately recruit and retain personnel unless they can bring people in locally

- NEC endorses providing FAA with authority to use targeted bid to hire and assign locally
- Possible compensation adjustments

Moving Forward: Industry emphasizes need for collaboration related to impacts from staffing, likewise important for industry to appropriately characterize its delay reporting
Northeast – NextGen Integration Working Group (NIWG) Update – Near-Term Implementations

**Industry Leads:**
Steve Brown, NBAA
Warren Christie, JetBlue
Mark Hopkins, Delta Air Lines

**FAA SME’s:**
Dave Foyle, FAA
Rob Hunt, FAA
Robert Novia, FAA
Northeast Corridor

• FAA currently executing planned and implementation improvements from October NAC Recommendations

• Focused activities are on improving the flow of aircraft into and out of the NEC

• Work currently advancing on 5 of the 10 operational needs identified by industry

• Laying the groundwork for the introduction of Trajectory Based Operations

• Air Traffic Facility experts have been integrally involved in implementation and determining subsequent initiatives
BREAK
NextGen Priorities Status – NextGen Integration Working Group: Priority Areas Milestone Reports

Co-Chairs:
Steve Dickson, Delta Air Lines, Inc.
Melissa Rudinger, AOPA
Data Comm

Industry Leads:
Chuck Stewart, United Airlines, Inc.
John O’Sullivan, Harris Corporation

FAA SME:
Jesse Wijntjes, ATO
Juan Narvid, ANG
Tower Services Waterfall – Q4 2016
- Completed challenge waterfall in December 2016
- Seven additional towers (ADW, RNO, CMH, RSW, CHS, BUF, and VNY) to be added by end of FY19
  - ADW IOC on November 8, 2017
  - RNO IOC on February 20, 2018

Implementation Framework for non-VDL Mode 2 Media – Q1 2017
- Moving forward with agreed to framework
- Affected operators working with their applicable Communications Service Provider (CSP) to investigate implementation options for VDL-0 in En Route

Initial Operating Capability (IOC) for Initial En Route Services at first Air Route Traffic Control Center (ARTCC) – Q3 2019
- Successfully completed transition to National Single Data Authority (NSDA) – October 21-22, 2017
- ERAM software changes required to support En Route CPDLC are in integration and test
- Continuing early ops evals, flight deck demos with stakeholders, and risk reduction events at ZKC
- Working risk mitigation strategies to address packaging challenges in ERAM, operator readiness for En Route ops, and implementation risks in the NAS

Airlines goal is to equip 1,900 aircraft
- 4,139 Data Comm equipped aircraft as of February 28, 2018 (includes FANS/VDL Mode 2, FANS/VDL Mode 0, business jets, and international aircraft)
- 1,757 aircraft have been equipped through the equipage initiative

Operational Summary
- Over 40,000 Data Comm ops per week – Passed 2 million Data Comm operations on January 1, 2018
- Participation from 11 mainline US carriers, 43 international carriers, 40 business jet operators, and GA
- 56 different aircraft types using Data Comm
DataComm Equipage

Increased Data Comm equipage will result in increased benefits
- Over 4,000 Data Comm capable aircraft in the NAS
- Approximately 38% of the US fleet is equipped for Data Comm
- The US fleet equipage for Data Comm is estimated to be 48-65% by 2025

Opportunity for some towers with a high concentration of non-equipped jets (i.e., Regional Jets) could have more equipped ops and realize increased benefits
- US Regional Jet fleet is over 1,700 aircraft that could be benefiting from Data Comm
- Majority of existing RJs do not have a path to upgrade for Data Comm
  - Potential for forward-fit on new RJs (e.g., Bombardier C-Series, Embraer E2s, etc.)
  - Some existing RJs could be retro-fitted via a software upgrade (e.g., Embraer 170/190s)

FAA and industry need to work together to identify plans for retrofit options and forward fit targets
- Currently part of the Data Comm NIWG Rolling Plan efforts
- Be part of a larger CNS equipage strategy for NextGen
Comm En Route - Initial Services Waterfall
Domestic EnRoute Services Waterfall
Risks/Challenges

- FAA has manpower constraints needed to support the current waterfall for DataComm Initial Enroute Services
  - FAA is assessing the impact to schedule
  - FAA expects to have a clearer picture by the end of March

- Industry concerns/impacts:
  - Delays financial and safety benefits of sought after capability
  - Affects training timelines
  - Elongated timeline is unacceptable
    - Elongates “splintered” NAS
    - Carriers will delay participation which will have a negative affect on system acceptability

Anything other than the agreed to timeline is not supported by operators
DISCUSSION
Multiple Runway Operations

Industry Leads:
Glenn Morse, United Airlines, Inc.
Jon Tree, Jeppesen/Boeing

FAA SMEs:
Bill Stanton, ATO
Paul Strande, ANG
Multiple Runway Operations

• **Wake RECAT implementation**
  - Wake RECAT commitments are on course
    - DTW training is underway, implementation by end of March
  - Safety Panel was held in February; assessing operational improvements to current wake RECAT 2.0

• **Dependent Stagger Reduction**
  - Updated 7110.308C Order in response to ALPA VNAV concerns
  - Authorizes SFO and 7 other sites for reduction to 1.0NM stagger

• **Dynamic Wake Separations/Time Based Separations**
  - Assessment of wind impacts to reduce wake separations is on course
  - Feasibility and operational impacts assessments are underway as well
Multiple Runway Operations
Risks/Challenges

Successful Completion of Requisite Safety Studies and Environmental Reviews and Achieving Stakeholder Alignment

- “Consolidated Wake Standard” and Dynamic Wake/Time Based Separation
- Resolution of “LNAV Only” Issue
- BOS Runway 4L RNAV Procedure for 7110.308 Operations
DISCUSSION
Performance Based Navigation

Industry Leads:
Steve Fulton, Sandel Avionics
Brian Townsend, American Airlines, Inc.

FAA SMEs:
Donna Creasap, ATO
Merrill Armstrong, AVS
Vertical Navigation - Track to Fix

- Since June 2017 NAC meeting - Many hours of meetings and discussions
- Achieved good understanding of the positions of stakeholders
- Developed good understanding of available mitigations
- Support from Performance-based Operations Aviation Rulemaking Committee (PARC)
- Next step requires specialized expertise
- PBN NIWG agreed to request PARC Steering Group to complete detailed plan for TF Established on RNP and provide recommended action
Resources for Deploying PBN
Risks/Challenges

- Construction and deployment of PBN procedures = physical highway and surface street infrastructure
- Industry endorsed PBN NAS Navigation Strategy that transitions to a “PBN-centric” NAS - national infrastructure effort
- Funding of FAA PBN activity is necessary to achieve the scale of effort necessary to achieve these goals
- Industry and FAA must be mutually invested and committed to developing a framework synchronizing PBN with TBO implementation
DISCUSSION
Surface Team

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

**FAA SMEs:**
Dave Foyle, ATO
Mike Huffman, ATO
Surface Operations & Data Sharing

• All commitments for the current rolling plan are complete
  o Surface Departure Management Demonstration Charlotte – Q4 2017
    ➢ Phase 1 of the NASA effort achieving significant early benefits ~ 95k lbs. of fuel savings since start of the operational demonstration in November 2017
  
  o FAA to Increase Data Sharing by providing additional Surface Surveillance data to Industry via SWIM – Q4 2017
    ➢ Providing subscribers additional aircraft position information into the non-movement areas (where available)

• TFDM program development continues on track to achieve IOC at PHX by January 2020 and CLT by March 2021
  o TFDM Terminal Publication (TTP): The success of TFDM metering depends on operators subscribing to TTP service via SWIM in order to receive important data including the Target Movement Area Entry Time for each flight.

  o TFDM will start publishing the data concurrent with the PHX IOC in 2020.
SWIM Industry-FAA Team (SWIFT)

- Forum has filled a void in communication by providing a single environment for collaboration communication and engagement around information and data sharing.
- Focus is on the “Operational Context” of data and bridging the Business - IT gap.
- SWIFT evolves and refocuses as industry needs change.
Data Sharing to Support FAA Surface Programs and Trajectory Operations

Risks/Challenges

- TFDM Terminal Publication (TTP) service
- Benefits to connect (equip) vs. Programmatic risks of nonparticipation
  - Technology requirements
  - Process
  - Non-airline (airports, business aviation, foreign carriers, etc.)
- Trajectory Option Sets (TOS)
- Collaborative big data
  - Joint data
  - Joint metrics
DISCUSSION
LUNCH
Surveillance Equipage Status
ADS-B Equipage Status

Jim Viola, FAA
Current State of Equipage as of March 1, 2018

- **Total Equipped:** 51,882
  - As detected by the ADS-B Performance Monitor

- **Percent of Estimated Fleet Equipped**
  - US Air Carrier: 29.4% - 35.2%
  - US General Aviation (includes EXP & LSA): 23.5% - 37.6%
  - International Air Carrier: 1.22%
  - International GA: 2.31%
  - US Mil and Special Use: 10.26%

- **Results of GA Rebate (closed September 18, 2017)**
  - 9,997 rebate payments were issued
  - 71 claimed rebates are undergoing the approval process now
GA Perspectives on ADS-B Out...AOPA Pilot Survey Says

- 94% say cost is biggest concern
- 66% based in/near metro area
- 50% fly cross county

- 40% already equipped
- 40% plan to equip by 2020
- 20% not sure when or waiting ‘as close as possible’ to 2020
Equipage Barriers for GA

- Cost is biggest barrier
  - 43% of GA aircraft have $25,000 or less hull value
  - 40% of GA aircraft have $40,000 or less hull value

- Lack of benefit
  - No new benefit or access
  - Can already get traffic & Wx
Incentivizing GA Equipage:

• Resume GA rebate program - $5M in unused funds
  • Lessons learned
  • Simplify validation requirements

• Simplified pathway to certification
  • Performance based
  • Non TSO

• Educational outreach on benefits
  • Online resources including an ADS-B selector tool
  • AOPAPilot Magazine feature articles and tech reviews
  • Contact our Pilot Information Center
ADS-B Equipage Status

Jim Viola, FAA
US Air Transport Operator ADS-B Out Equipage Plans and Observed Installs

Reason for increasing difference between plans and observed installs is unknown. Updated plans are needed.
US 14 CFR Part 121 Aircraft ADS-B Out Equipage by Model

- Values at top of bars indicate proportion of aircraft observed compliant from total number of aircraft by model
- These 23 models constitute 99% of the 121 fleet

COMPLIANCE DATA CURRENT AS OF 02/01/2018
ADS-B IN PROGRAM LAUNCH

American Airlines

INITIAL INSTALLATION AND OPERATIONS PROJECTED Q1-2019

LARGE-SCALE EVALUATION TO MEASURE & REPORT BENEFITS

AIMING AT INCREASING NAS EFFICIENCIES
WHAT LED TO OUR DECISION?

- Our 2009 NextGen partnership established a foundation for potential ADS-B In benefits with our A330 fleet

- Near term solution must be a cost effective retrofit solution to allow equipage of current aircraft

- Equipped A330 fleet with CDTI SAMM, CAVS and M&S applications

- Pilot acceptance and use was excellent, but impacted by limited ADS-B Out targets and an avionics architecture that was no longer viable
**Viable ADS-B In Retrofit Solution**

**New ADS-B In Architecture**
- Maximizes use of existing flight deck displays
- Forward-field ADS-B IN data presented on AGD
- Significant installation labor reduction (NO EFB)
- ADS-B in applications integrated in TCAS unit

**A330 Class 3 EFB Installation**

**Class 3 EFB Installation**
WHAT IS THE INVESTMENT?

• American to equip entire Airbus A321 fleet with ADS-B In system
  • Normal operations
  • Options for further expansion

• American Benefit Case is anticipating the following operational benefits:
  • Higher achievable throughput
  • Decreased spacing buffer
  • Increased Pilot Situational Awareness
  • Less delay vectoring
  • Reduced missed approaches
CAVS
(CDTI ASSISTED VISUAL SEPARATION) EXAMPLE

There are no special ATC phraseology or procedures. ATC will issue or approve a visual approach and if traffic is a factor they will call out the traffic’s position and distance.
CAVS Example

Once the pilot has:
- visually acquired traffic (out the-window),
- correlated (matched) the traffic on the CDTI with the traffic outside,
CAVS Example

Once the pilot has:

- visually acquired traffic (out the-window),
- correlated (matched) the traffic on the CDTI with the traffic outside,
- reported traffic in sight and accepted a visual approach clearance,

the pilot can then use the traffic to follow (TTF) information on the CDTI to assist in maintaining visual separation during the approach.
**CAVS Example**

Once the pilot has:
- visually acquired traffic (out the-window),
- correlated (matched) the traffic on the CDTI with the traffic outside,
- reported traffic in sight and accepted a visual approach clearance,

The visual approach may be continued if the traffic is temporarily lost out the window (due to haze, glare, ground clutter, etc.) as long as the TTF is displayed as a chevron (high accuracy) and spacing remains at least 2.5 NM.
Cockpit Display of Traffic Information Tools

- **CDTI Assisted Spacing**
  - **CAVS** - CDTI Assisted Visual Separation
  - **CAPP** - CDTI Assisted Pilot Procedure
  - Allows pilot to use ADS-B In information for traffic acquisition
  - Maintain visual approach clearances/rates in lower visual conditions
  - Both have the potential to work with no change to airspace and minimal ATC change

- **Initial Interval Management (I-IM) Operations**
  - Greater spacing precision to increase efficiencies of PBN procedures
  - Assist controllers with time-based spacing operations
**Benefits from ADS-B In Equipage**

- Improved Pilot Situational Awareness
- Use of CDTI (CAVS, CAPP) to enable visual runway rates
- Use of I-IM to enable higher runway rates using PBN combined with ground and aircraft time based management
  - Inter Arrival Time (IAT) management (best case)
    - No gaps in flow and minimal heavy aircraft
  - Real Time speed commands are provided directly to the pilot to maintain assigned spacing

<table>
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<th>Interval Management</th>
<th>No Automation</th>
<th>Most Sophisticated Ground Automation</th>
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- Support future applications such as
  - Paired Approach
  - Dependent Converging Operations
How Will This Be Evaluated?

- ADS-B In Retrofit Spacing (AIRS) Program
  - Data gathering from sizeable fleet operations
    - FOQA
    - FAA operational data from the NextGen Office
    - PDARS
    - Monitoring of behavioral changes from pilot/controller workgroups
  - Opportunity to measure and report on benefits
  - Generate benefits report to be shared with industry
  - Risk mitigation in support of planned deployment of Interval Management in the NAS
CLOSING THE LOOP

• Our Commitment
  – Refocus Industry on ADS-B In as a viable NAS tool
  – Provide operational data to validate feasibility and benefits
  – Maintain an effective team

• Our ask to the NAC
  – Support FAA to ensure a successful project
  – Help increase awareness to stakeholders
  – Work towards furthering benefits, raising the priority of ADS-B In on the NextGen Roadmap and support the development of CAPP
time for questions
Drone Advisory Committee Report
OTHER BUSINESS
Summary of Meeting and Next Steps

dfo and nac Chairman Closing Comments
Concluding Items

2018 Meetings

- June 27th, Washington, DC - MITRE
- October 10th, Location TBD
AGENDA HIGHLIGHTS

- NextGen in the Northeast Corridor: Let’s Do This!
- Integrating Drones into the Airspace: What’s Next?
- One-on-One Debates: Breaking the Barriers to NextGen
- One-on-One Debates: Breaking the Barriers to UAS Integration
- National Academies Report Recommendations: Assessing Risk of Drones Integration
- Aviation as Essential Infrastructure: What Would You Do with an Extra $XB?
- What’s Happening in the Autonomous Automobile World? – Planet M
- NextGen Success Stories – Measurable Benefits
- FAA’s NextGen Plans
- Phase 2 Performance Standards for Detect and Avoid, and Command & Control for UAS
- Moving Civil Aviation Authorities to Risk-based Regulations: A Discussion with Mark Swan, UK CAA
- Cybersecurity
- Standards Development Organizations (SDOs), No Gaps, No Overlaps: A look at Coordination Across SDOs
- Drones Making the World Better: Highlighting Cool Applications and Integrated Pilot Projects

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Adjourn
## Attendees:
March 14, 2018 Meeting of the NextGen Advisory Committee Palm Bay, FL

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Viola, Jim
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Woods, Jeff
Zoiss, Ed
Meeting Summary, October 4, 2017

NextGen Advisory Committee (NAC)

The twenty-second meeting of the NextGen Advisory Committee (NAC) was held on October 4, 2017 at the United Airlines Headquarters in Chicago, IL. The meeting discussions are summarized below.

List of attachments:

- Attachment 1 – Attendees
- Attachment 2 – FAA Report/Designated Federal Officer remarks
- Attachment 3 – June 28, 2017 NAC Meeting Summary
- Attachment 4 – Revised Terms of Reference for NAC
- Attachment 5 – NAC Chairman Bronczek Report
- Attachment 6 – Joint Implementation Commitments for Improving Operations in the Northeast Corridor - Phase Two - Interim Report
- Attachment 7 – Joint Analysis Team: Performance Assessment of Boston/Gary Optimal Profile Descents and DataComm
- Attachment 8 – NextGen Priorities: 2017 Joint Implementation Plan

Welcome and Introduction

Chairman Bronczek began the meeting by thanking the FAA Administrator, Michael Huerta, and the FAA team for their support of the industry.

Administrator Michael Huerta then welcomed the NAC members and thanked the aviation industry for their efforts to support the hurricane emergency relief efforts. Next, he took time to recognize Jim Eck for his 22 years of service to the FAA and aviation industry. He highlighted Jim Eck’s commitment and leadership to the NextGen office and the greater aviation industry. Administrator Huerta commented on his own tenure as the FAA Administrator and thanked the NAC for all the progress they have made. He emphasized that NextGen has delivered results to the industry through the rollout of DataComm and Wake ReCat. Airlines are sharing information through System Wide Information Management (SWIM). Performance Based Navigation (PBN) efforts are laying the foundation for the future. He emphasized that the collaboration builds strong working relationships and paves
the way for continued improvements. He ended his remarks by thanking the NAC members for giving their time and energy to participate in the government and industry collaboration.

Following his remarks, the meeting formally began at 9:05 by NAC members (Attachment 1) and those in attendance introducing themselves. Chairman Bronczek thanked United Airlines, Boeing, and Rockwell Collins for hosting the NAC meeting and events. He recognized new members, Tom Kemp of Alaska Airlines; Huntley Lawrence of Port Authority New York and New Jersey (PANYNJ); Gen. Tommy Williams of DoD; and Ed Zoiss of Harris Corporation. Next, RTCA President Margaret Jenny recognized the retirement of Lillian Ryals of The MITRE Corporation, acknowledging Ms. Ryals for her dedication to the NAC and the aviation community. This was her last meeting as a NAC member.

**Designated Federal Officer Statement (DFO)**

FAA Deputy Administrator and DFO Dan Elwell presented the Federal Advisory Committee Act notice that governs public meetings. NAC member introductions followed the DFO’s opening statement.

**FAA Report**

Dan Elwell opened his comments (Attachment 2) by recognizing the victims of the Las Vegas shooting and noting the joint efforts of the FAA with FEMA and DoD to reestablish normalcy in Puerto Rico following the hurricane.

He took time to underscore the purpose of the NAC, emphasizing that his goal is for each meeting, tasking, working group, and discussion to continuously drive toward results. Most importantly, he wants the NAC to be a forum for direct and candid industry discussions that hopefully lead to consensus recommendations, even though he knows that might not always be possible. He reiterated that FAA is there to hear industry’s advice.

Commenting on the budget, he shared that fiscal year (FY) 2018 funding is flat with the FY 2017 budget; however, FAA will continue to work with OST and OMB on the FY 2019 budget request and the focus will remain on the four technologies that will achieve maximum benefits—Data Comm, Time-Based Flow Management, the NAS Voice System, and the Terminal Flight Data Manager.

Mr. Elwell addressed the President’s set of principles for air traffic control (ATC) reform, which propose improving safety oversight and protecting national security interests while maintaining open access for all airspace users. He stressed that the air traffic control reform proposal is not an indictment of the men and women who make the system operate as well as they do, but a proposal designed to maximize NAS safety and efficiency for the next century by liberating the provision of air traffic services from annual funding uncertainty and unnecessary bureaucratic constraints.

Next, he provided an update on UAS initiatives, specifically acknowledging the Drone Advisory Committee’s (DAC) efforts to establish performance-based regulations and
expressed his desire to have a summary of DAC efforts communicated to the NAC. He noted that the FAA continues to work closely with its government partners and industry stakeholders to foster innovation while creating a performance-based regulatory framework for safe UAS integration. He also commented on the progress of ADS-B equipage and the work of the NAC Subcommittee (NACSC) on the implementation of NextGen in the Northeast Corridor (NEC). By focusing on improving the execution of today’s operations in the NEC, stated Mr. Elwell, the groundwork will be laid in the corridor for the FAA’s longer-term vision of Trajectory Based Operations (TBO).

**Outcome:** Future NAC meetings will include a brief summary of DAC activities. The NACSC will review and discuss the FAA vision for TBO document that was distributed to the NAC members.

**Review and Approval of June 28, 2017 Meeting Summary**

Chairman Bronczek asked for consideration of the written summary of the June 28, 2017 meeting. By motion, the Committee approved the Summary (Attachment 3). Chairman Bronczek then asked for consideration for the revised Terms of Reference. By motion, the Committee approved the revised Terms of Reference (Attachment 4).

**Chairman’s Report**

In his remarks (Attachment 5), Chairman Bronczek challenged the NAC to consider stretch goals for the NEC in addition to pursuing the low-hanging fruit. He emphasized a bold approach toward equipage and procedure implementation that leverages current capabilities to build a system that is truly NextGen. He also highlighted culture issues and the need to address change-management across all boundaries. The implementation of new capabilities requires change-management; this is facilitated by forging consensus among all key stakeholders.

**Making Single European Sky ATM Research (SESAR) a Performing Operational Reality**

Massimo Garbini, Managing Director of SESAR’s Deployment Manager Organization, described the operational framework of the aviation technology policy in the European Union. He emphasized that SESAR Deployment Manager and SESAR Joint Undertaking are separate organizations operating jointly to implement the European ATM Master Plan.

SESAR Deployment Manager consists of 11 Air Navigation Service Providers, 4 major airlines, and 24 airports. Over the past three years the Deployment Manager executed 295 projects, through 86 implementing partners in 34 countries.

**Discussion:**

In response to a question from a Committee member about how SESAR analyzed noise environmental impacts, Mr. Garbini explained that they prepare plans that consider environmental compliance and appropriate benefits and cost analysis.
He addressed a question related to the impact of BREXIT by stating that it is early in the process of implementation, but at this point, minimum impact is expected.

**Northeast Corridor Phase Two**

Warren Christie, Senior Vice President, Safety, Security and Air Operations, JetBlue, co-chair of the NEC, reviewed the NEC NextGen Integration Working Group (NIWG) efforts over the last three months. He highlighted the goals/metrics identified in the Phase 1 analysis and the collective efforts of the Phase 2 collaborative analysis.

The Interim Report covers 24 specific initiatives recommended for deployment in the first 18-months’ time frame, from October 2017 through March 2019, and outlines preliminary information for initiatives recommended for deployment in 18-36 months, and finally, those 3 years or greater. It targets improving today’s operations and setting the path for the future in the Northeast Corridor (Washington, DC/Baltimore, Philadelphia, New York and Boston airports, and associated airspace) with the goals of operating the full operation, on-time and predictably. Mr. Christie observed that the recommended initiatives, at this point, are more “NowGen” than NextGen. But, the next phase offers opportunities for more advanced implementations.

The Northeast Corridor recommendations document commitments by the FAA as well as the aviation industry, including aircraft operators and airports. Industry and the FAA must work closely with the FAA to conduct outreach to the communities affected by changes in procedures. Commitments also include pledges to train operational personnel in support of key collaborative initiatives. The final recommendations (March 2018) will identify creative mitigations to implementation challenges such as resource availability, funding, equipage and impacts to local communities.

Mr. Christie identified the key risk and resource constraints identified by the working group, including controller staffing, specific facility-level constraints (e.g., runway configurations), environmental impacts, and budget constraints.

The two NextGen initiatives identified in the report are Area Navigation (RNAV) and Required Navigation Performance (RNP) procedures and the analysis of simultaneous operations at widely spaced runways.

**Discussion:**

A member representing the interests of communities located near major airports volunteered to provide a resource for the on-going environmental and noise analysis. Another member emphasized that success for the initial implementations requires identifying budget limitations up front and managing within those constraints. A possible way to work through the limitations is to consider third party sources for funding, something the NAC agreed should be considered for future work of the NEC. DFO Elwell commented on the need to engage potential airport sponsors in the NEC.
One member commented that ground-delay programs are increasing at the New York airports and should be considered in metrics. In response to a question related to the scope of the initiatives and whether these are prioritized in the right order, Mr. Christie commented that the NEC NIWG believed the list does indeed represent the highest priorities for industry. Another member stressed the importance of identifying the root causes of performance problem areas in the NEC, recognizing that a smaller list of actual achievements is preferred to a longer list of unfinished projects without benefits.

The Committee engaged in a robust conversation about the impact of FAA controller staffing on the implementations. Some members commented that industry (i.e., airlines) could also be facing resource constraints. The NAC agreed that additional discussion is needed related to FAA and industry staffing in the NEC.

Several members added that operators must equip with appropriate NextGen equipage for the deployments to be successful. DFO Elwell emphasized that the operators must continue the dialog among themselves regarding getting to the requisite percentage of equipped aircraft.

At the suggestion of DFO Elwell, a video was presented on Enhanced Visual Flight System (EFVS). This technology is intended to increase the situational awareness and the pilot capability in instrument conditions. The Committee agreed to have this advanced capability considered in the work of the NEC.

Concluding the discussion of the NEC recommendations, Chairman Bronczek echoed the sentiments of many NAC members by thanking the NEC NIWG for their efforts and encouraged everyone to continue to be involved in the process.

**Outcome:**

- The NEC Phase Two Interim report was approved by the NAC.

The following action items were identified for the next steps in the NEC work:

- The National Association to Insure a Sound Controlled Environment (NOISE), along with appropriate FAA environmental offices (ATO and AAE), to provide support to community outreach aspects of NEC.
- Realizing not all NextGen resources come from the FAA, identify other opportunities that are available for investment by airport and aircraft operators, along with options for reimbursable agreements.
- NEC Metrics to incorporate Ground Delay Program into the next phase of the recommendations.
- Assess if/how to leverage the capabilities of EFVS in the NEC, including correlating benefits with varied levels of equipage.
- For NEC resources – gauge health of facility staffing, and that of airport and aircraft operators, connecting these with various implementation initiatives.
Joint Analysis Team (JAT) – Boston Optimized Profile Descent (OPD)/DataComm Benefits Assessment

JAT Co-Chairs Dave Knorr, FAA, and Ilhan Ince, ITI Aviation, presented the Team’s report on quantifiable benefits from selected NextGen capability deployments. The report presented fuel savings and associated emission reductions from Optimized Profile Descents (OPDs) in Boston, MA, and safety and workload benefits from OPDs in Gary, IN. The report also documented the analysis of DataComm, a key NextGen Program, and demonstrated promising savings in taxi-out time for DataComm-equipped aircraft.

Outcome:

- The NAC approved the Boston Optimized Profile Descent/DataComm Benefits Assessment report developed by the JAT.

In addition to the JAT findings, the Committee received briefings from operators about their experiences with NextGen capability deployments. Southwest Airlines explained their decision to equip their aircraft with DataComm and described the reduction in taxi time they are experiencing as they use this capability. A representative from Boeing’s Corporate Flight department shared their experiences in Chicago with OPDs that deconflict business jet flights into Gary, IN, from other general aviation traffic around Chicago, thereby decreasing emissions and reducing fuel burn.

Airline Equipage Update

Greg Tennille of The MITRE Corporation provided an update on the operator equipage information from mainline and regional airlines. The survey findings show that the current equipage rates have remained flat. The current level of equipage does not meet the level required to achieve full benefits of PBN implementation.

Discussion:

A committee member commented that to achieve PBN benefits would require nearly 100% equipage, asking about the PBN equipage rates in the NEC. Another member suggested applying a DataComm-incentive type program to encourage PBN equipage.

Outcome:

- MITRE will continue to update the study results and report to the NAC at future meetings.
- The NACSC was asked to examine possible opportunities to apply the principles of DataComm-type financial incentives to PBN equipage.

NextGen Priorities Status –NIWG
Each of the four NIWG Teams reported on the status of implementations and highlighted relevant discussion topics.

**Performance Based Navigation**

Industry Co-Chair, Brian Townsend, American Airlines, reiterated the points from the previous discussion that equipage is key to success of many of the PBN NextGen initiatives. While RNAV equipage has led to performance improvement, mixed equipage and the variations in capabilities has limited those benefit. It was agreed that industry must identify the best means to leverage current capabilities, while moving toward the expected performance gains of more advanced PBN procedures. He also noted the FAA’s PBN NAS Navigation Strategy assumes that operations at the busiest airports will be equipped with RF and VNAV by 2025, but inventory trends are not approaching those levels.

Mr. Townsend also explained that the PBN Team continues its work with the Airline Pilots Association (ALPA) to address issues raised by the associated concerning Vertical Navigation (VNAV). The PBN NIWG is analyzing how this, and the lack of requisite levels of equipage (highlighted in the MITRE studies), will affect plans for the implementation of Established on RNP (EOR) both Radius to fix (RF) and Track to Fix (TF) in the NAS.

**Discussion:**

Based on an overview on levels of equipage for the United States Air Force, by 2020 54% will be equipped to comply with the requirements for ADS-B, and 68% by 2025. Some portion of the fleet (based on mission) may never be equipped.

**Outcome:**

- The NACSC/PBN NIWG Team, using inventory of aircraft fleet (on-going initiative), including PBN NAV capability for regional and mainline aircraft, to use this information to complete assessment of the effect on ALPA VNAV concerns on PBN Milestones, including mitigations related to Established on RNP and develop recommendation for NAC.

**Data Communications**

FAA’s Jesse Wijntjes, and Industry Co-Chair, Chuck Stewart, United Airlines, presented an update of DataComm’s NIWG joint/industry progress toward milestones. Mr. Wijntjes reported that there are more than 36,000 DataComm ops using tower services per week—a 62% increase since the beginning of 2017. Twelve mainline US carriers, 39 international carriers, 39 business jet and general aviation operators are currently using the service.

Mr. Stewart explained that due to DataComm avionics issues associated with the Pegasus 1 Flight Management System (for the upcoming En Route services aspect of the DataComm program), the B757 and B767 aircraft will not be able to receive re-routes while airborne. A
temporary ground mitigation has been developed, but he emphasized that it is not a long-term solution.

Discussion:
A committee commented that Boeing has a list of high-priority technical issues for addressing the Pegasus 1 limitations that will be reviewed and discussed with the industry in both the DataComm NIWG and DataComm Implementation Team (DCIT).

Outcome:
- The industry and the FAA will continue working to identify a long-term solution for the B757/767 issue and report back to the NAC.

Surface Operations & Data Sharing
Rob Goldman of Delta Air Lines presented an update from the Surface NIWG. The FAA will increase data sharing by providing raw sensor surface data in the non-movement area later this month. In addition, NASA’s Airspace Technology Demonstration 2 (ATD-2) project in Charlotte, NC, includes data-sharing.

Two airlines are providing data with two additional airlines committed to sharing data based on the defined elements for the Terminal Flight Data Manager (TFDM) system by the end of the year. The FAA’s data dictionary is being developed jointly through industry and FAA collaborations.

Discussion:
FAA’s Jim Eck emphasized the large amount of data and information being made available to airlines, describing how it can be used by both the FAA and the operators to manage operations.

A member commented that the airport operators should also take advantage of the information on SWIM to maximize the coordination of resources. Another member added that sharing information with airports has operational, safety and efficiency implications. An FAA representative commented that this is a focus item for the NIWG.

Outcome:
- The Surface NIWG will continue their work with FAA, the airlines and airports to encourage additional users to participate in data sharing.

Multiple Runway Operations (MRO)
Glenn Martin, FAA, spoke about Wake ReCat implementation explaining that the next steps will concentrate on developing a national standard. The FAA will continue to work with the
MRO NIWG, which has enjoyed strong industry-FAA collaboration. He emphasized that the sites identified for 2018 remain on track to complete their milestones.

**Discussion:**
In response to a question from a member about the FAA’s work to develop a National Standard, Mr. Martin, FAA, explained that this will effectively ensure successful deployment of Wake ReCat implementation at all eligible airports. The FAA’s goal is to deploy the capability across the country.

**Outcome:**
- The MRO NIWG Team will continue discussing the National Standard with the NIWG.

**NextGen Priorities Development Plan**
Jim Eck presented an overview of the NextGen Joint Implementation Plan that documents the status of implementations in the four NIWG areas for 2017. The plan also includes the NEC recommendations.

**Outcome:**
- The NextGen Priorities, October 2017, Joint Implementation Plan Update Including the Northeast Corridor Report was approved by the NAC.

**ADS-B Equipage Status**
Mark Steinbicker, FAA, presented the status of industry equipage to meet the FAA’s January 2020 deadline.

**Discussion**
Mr. Elwell emphasized that the January 2020 ADS-B deadline will not be extended. A Committee member stated that Congress should not get involved in altering the mandate. Another member emphasized the need for major carriers to discuss the mandate with their regional and business carriers to ensure they are prepared to meet the date.

Chairman Bronczek asked the NAC members to identify any constraints to meeting the 2020 mandate. The NAC members representing the mainline and regional airlines agreed that they have met, or are on track to meet, the mandate.

A Committee member from a UAS company commented on the need for the manufacturers to provide enough equipment to meet the UAS ADS-B requirements. The member commented on the necessity to validate the number of affected vehicles, and the need for a supply chain to meet the demands for ADS-B equipment by the UAS manufacturers. The use of UAS/drones in recent hurricane and wildfire relief efforts was a learning experience for
both the industry and the FAA on how to utilize this capability in a major metropolitan area. These concerns will be shared with the Drone Advisory Committee (DAC).

Summary of Action Items and Next Steps

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Responsible Entity</th>
<th>Source of Action</th>
<th>Completion Date</th>
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<tbody>
<tr>
<td>2. Equipage -- Using inventory of aircraft fleet (on-going initiative) including PBN NAV capability for regional and mainline aircraft, and use information to complete assessment of VNAV concern effects on PBN Milestones including those related to Established on RNP and develop recommendation for NAC.</td>
<td>RTCA-NACSC</td>
<td>NAC June 2017</td>
<td>C/N/S Equipage, NACSC On-going PBN Milestones, NIWG June 2018</td>
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<td>4. National Association to Insure a Sound Controlled Environment (NOISE), along with appropriate FAA environmental offices (ATO and AAE) to provide support for including community outreach aspects of NEC.</td>
<td>RTCA/FAA</td>
<td>NAC October 2017</td>
<td>March 2018</td>
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<td>5. Realizing not all NextGen resources come from the FAA, identify other opportunities that are available for investment by airport and aircraft operators, along with options for reimbursable agreement.</td>
<td>RTCA/FAA</td>
<td>NAC October 2017</td>
<td>March 2018</td>
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<td>6. NEC Metrics should incorporate the Ground Delay Program into the next phase of the recommendations.</td>
<td>RTCA/FAA</td>
<td>NAC October 2017</td>
<td>March 2018</td>
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<td>Task</td>
<td>Responsible Parties</td>
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<td>7</td>
<td>Assess if/how to leverage the capabilities of Enhance Flight Visions Systems (EFVS) in the NEC including correlating benefits with varied levels of equipage.</td>
<td>RTCA/FAA</td>
<td>NAC October 2017</td>
</tr>
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<td>8</td>
<td>For NEC resources – gauge health of facility staffing, and that of airport and aircraft operators, connecting these with various implementation initiatives.</td>
<td>RTCA/FAA</td>
<td>NAC October 2017</td>
</tr>
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<td>9</td>
<td>Examine possible opportunities to apply the principles of DataComm-type financial incentives to PBN equipage.</td>
<td>RTCA</td>
<td>NAC October 2017</td>
</tr>
<tr>
<td>10</td>
<td>Future NAC meetings will include a summary of DAC activities.</td>
<td>RTCA/FAA</td>
<td>NAC October 2017</td>
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<tr>
<td>11</td>
<td>NACSC will review and discuss the FAA vision for the TBO document.</td>
<td>FAA/RTCA</td>
<td>NAC October 2017</td>
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<td><strong>Existing/On-Going</strong></td>
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<td>11</td>
<td>Equip 2020 updates – Standing agenda item for update on operator equipage.</td>
<td>RTCA/FAA</td>
<td>NAC February 2015</td>
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<td>12</td>
<td>NextGen Integration Working Groups Joint Implementation Teams:</td>
<td>RTCA/FAA</td>
<td>NAC February 2014</td>
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<td>- DataComm</td>
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<td>- Multiple Runway Operations</td>
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<td>- Surface &amp; Data Sharing</td>
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<td>13</td>
<td>Joint Analysis Team – evaluation of NEC implementations—baseline and post implementation</td>
<td>RTCA/FAA</td>
<td>Initial JAT creation FAA letter, August 2015 FAA Letter, April 2017</td>
</tr>
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</table>

RTCA provided the meeting dates for 2018:

- March 14 - Melbourne, Florida hosted by Harris
- June 27 - TBD
- October 10 - TBD

**Chairman Closing Comments**

Chairmen Bronczek made closing remarks, thanking United for hosting, and for everyone’s participation. The meeting adjourned at approximately 1:40 pm.
Opening

• Welcome to 23rd meeting of the NAC
• Thank you to Ed Zoiss, President, Electronic Systems, Harris Corporation for hosting us here in Melbourne, Florida
• Welcome new members:
  o Howard Attarian, Senior Vice President, Flight Operations, United Airlines
  o Eamonn (pronounced AA-Men) Brennan, Director General, Eurocontrol
  o Major General Donald “Louie” Lindberg, USAF
  o Gregg Leone (pronounced Lee-Own), Vice President and Director, MITRE/CAASD
  o Eric K. Fanning, President, Aerospace Industries Association
  o Jim Viola, FAA Deputy Associate Administrator for Aviation Safety
  o Bailey Edwards, FAA Assistant Administrator for Policy, International Affairs, and Environment
• I hope you have all had time to review the materials we will cover in today’s meeting and had time to discuss with your representatives.

• You are not a spectator today. We want your thoughts, your concerns, your kudos, your feedback. Do not be bashful. This is your chance to ask questions and to weigh in on the important issues before us.

NextGen in the Northeast Corridor

• As we gather today-the Committee has identified the huge potential benefits of modernizing air transportation (NextGen) in the Northeast Corridor (NEC).

• This is critical because delays in the NEC account for nearly half of all delays in the entire National Airspace System (NAS).

• As goes Northeast traffic so goes the nation – making improvements helps the entire system.

• Airlines and airports have made and continue to make billions in investments at key NEC airports to serve the needs of the travelling public.

• It is important that the air traffic system is capable to support the needed access in an efficient manner.
• Weather accounts for many of the delays, requiring effective strategies for managing traffic and identifying technologies that can provide more effective use of system capacity.

• A set of near-term implementations are underway that we approved in October – the status will be reported to us as the NAC approved actions are designed to improve operations this summer and launch initiatives that will pay dividends soon for improved performance.

• Today I am challenging my colleagues to make the commitments by both industry and FAA necessary to advance the NEC on ten industry priorities for the Northeast Corridor designed for implementation in 2019-2021.

• The purpose is to improve:
  o Deconflicting airports
  o Enhancing airport and airspace throughput
  o Improving the balancing of demand and capacity in NEC traffic flow

• These are good for Passengers and Businesses who rely on air transportation with measurable metrics to evaluate the effectiveness of implementations.
Key Challenges

- Community involvement – and we must support the FAA if we are going to be successful.
- Equipage for aircraft to fly advanced procedures
- Controller staffing in New York – something my counterparts in the industry are emphasizing
- As a committee, we need to discuss how and then collectively step forward and state our commitment to moving forward.

Other Meeting Topic Areas

- The Committee will hear reports from Four Priority Teams working on implementations of DataComm, Multiple Runway Operations, Performance Based Navigation and Surface and Data Management. These reports will highlight a success and present a risk item that we should discuss to help guide the work of the NAC Subcommittee and the Teams.
- This is especially important as the teams are developing the rolling plan for implementations in 2019-2021. This is our opportunity to speak up and let them know where collectively we want to be in implementing NextGen to incorporate into these plans.
• AOPA will report on challenges the owners of light general aircraft are having as the deadline for ADS-B approaches.

• American Airlines will provide us with the background on the decision they made to equip some of their aircraft with an ADS-B In capability. This is the first carrier to make this type of investment and it is insightful for us to hear from them.

• We will also have the FAA give an update on its response to the recommendation from the NAC on enhanced surveillance for oceanic airspace. This is important as operators equip with ADS-B and air service providers around the world are implementing satellite-based ADS-B services.

Summary

• Thank you for attending today and your commitment to collective work to implement NextGen.

• Consensus among the industry must continue for success—whether we are addressing policies, strategies for implementations and improving daily operations.
DAN ELWELL

- Thank you, Dave [Bronczek], and thank you, Harris [Corporation].
- I am pleased to welcome some new members to the FAA Senior Management Team. A month ago today, Mr. Bailey Edwards joined the FAA as Assistant Administrator for Policy, International Affairs, and Environment.
- He was the Policy Director for Aviation, Space, Science, and Competitiveness on Senate Commerce for Chairman Thune.
- James Viola, Acting Deputy Associate Administrator for Aviation Safety, is here with us today as well. We are very happy to have him fill John Hickey’s shoes here…..

Reauthorization

- We’ve gotten our feet underneath us with NextGen, and I’m hopeful that Reauthorization can help us deliver.
- We’ve gotten way too good at dealing with shut-downs, sequestration, and short-term extensions. That’s a skill-set no one wants to have, and since everyone recognizes the need for change, we should make the most of this year’s reauthorization cycle to make important reforms happen.

Budget Development FY19 and Beyond

Total Funding for FAA

- Let’s turn now from reauthorization to budget development for FY19.
• The proposed budget for the FAA overall is $16.1 Billion. This is all online, but briefly:

• Of that $16+ billion, **$953 million is the proposed allocation for NextGen**, with:
  - $101 million in Operations
  - $833 million in Facilities and Equipment, and
  - $20 million in Research.

• I think this budget reflects the collective vision of the NAC. It focuses funding on the priorities that will achieve the maximum benefits:
  - $114 million for Data Comm
  - $21.2 million was requested for Time Based Flow Management
  - And concerning Terminal Flight Data Manager and System Wide Information Management, the budget request to continue SWIM implementation is $59M.

**Research & Development Budget Targets**

• The FAA’s R&D request of $74 million includes a temporary hiring freeze specific to that program, and it includes **$19.5 million for NextGen research**.

**Update on Enhanced Surveillance Recommendations / Status –**

• Since we met in Chicago, we have an update on Enhanced Surveillance.

• We are fundamentally supportive of space-based ADS-B. We have to do a business case, though, and it is difficult to make the case that the government should cover all the costs. We continue to analyze both costs and benefits, in
anticipation of a decision this year, but the carriers will need to have some skin in the game.

- To support the use of space-based ADS-B, regardless of who pays, we are enhancing automation (ATOP—Advanced Technologies and Oceanic Procedures) that would allow us to process space-based ADS-B data in the oceanic environment by mid-2020.
- We continue to analyze the benefits and costs of enhanced surveillance in the oceanic environment, refining the business case for specific service volumes.
- We plan to update our decision body, the Joint Resources Council, on the analysis at the end of this month.
- Following that (in early April), we are prepared to share and receive feedback on the latest analysis with interested industry stakeholders.
- We are aiming for a final investment decision in September 2018.

**State of PBN**

- We also have an update on PBN.
- You all know we’ve had some great successes here
- We’re re-evaluating active airspace projects: their schedules, budgets, available resources, and potential benefits and risks.
- We have four remaining Metroplex projects: Cleveland/Detroit, Las Vegas, Denver, and South Central Florida.
- After careful review, we are prepared to continue with Cleveland/Detroit and Las Vegas Metroplexes.
- We want to reinitiate consultation with our stakeholders in South Central Florida and Denver to ensure increased advocacy and engagement from our partners in these projects.
• But we need the airports and the operators to take a more active role with outreach to local officials and others so they understand and are focused on the economic vitality efficient airspace operations mean for those regions. They need to help make sure they understand why we believe proposed changes are better for their airports and their communities.

• If we want to gain the benefits that PBN can offer, we have to do the work together, up front, and set these projects up for success.
  o Participation and advocacy for the requested change to the airspace: This means meeting with the airport and explaining what the challenges are – what is the problem that this procedure or procedures are designed to solve?
  o Participation and advocacy in meetings and discussions with key local and national elected officials. The Mayor, City or County Council.
  o Participation and advocacy with other interested members of the local community. Chamber of Commerce, Convention and Visitor’s Bureau or other local groups.

• At the same time, we are shifting from the metroplex process to scalable PBN projects implemented through a single site process. This will result in projects that are more manageable and focused.

• Since 2014, the single site process has governed smaller scale implementations, which supports the modernization of the national airspace system and will continue to be the process for airspace changes in the NAS.

• The FAA is also working through budgetary constraints and prioritization for single site implementations. We are taking a pause, we anticipate that the review will be complete in June 2018 and we will have more information to share at that time.
**Advancing NextGen**

- We are committed to implementing and advancing NextGen in the Northeast Corridor. We have produced a vision that links current PBN and time, speed and spacing work to our path to trajectory based operations.
- We are developing a roadmap that incorporates the principals and elements of initial TBO for the Northeast Corridor and moves us to increased throughput and better predictability.
- We are developing a plan to ensure that the Change Management and workforce communication and education is integrated to insure success.
- To make these advancements beneficial, we must have a corresponding level of airline participation.

**Equipage Participation – Required to realize full benefits in the NEC**

- Equipage: We’re less than 22 months out from January 1, 2020. If you’re not in the queue, you should be concerned.
- Any aircraft flying in rule airspace that is not equipped is going to be on the outside looking in. We’ve been saying this for eight years.
- Let me put the question directly to you: what should we do about non-compliant aircraft in 2020? I’d like to hear grass-roots opinions.
- Where are we now? The rates are lagging. That’s a real concern.
- So we’re planning additional outreach to all 121s, international carriers, commuter operators, certified flight schools, and avionics manufacturers.
- We’ll contact each of you – and other company executives not represented on the NAC –in the next few weeks.
• We’ve already made a similar request to 10 Federal departments and agencies that operate aircraft, asking for their updated equipage plans; now we’re asking the same of you.
• Now, my ask to you: We need your help to provide updated data to us, on each of your plans to equip your fleets in order to assess progress towards meeting the mandate. And we plan to compare these updated plans to the time remaining before the effective date.
• We would also like you to identify any challenges or risks for your particular operations and fleet mix.
• In addition to conducting outreach with the airlines, we will also be contacting the major avionics manufacturers asking for their updated plans to support their customers, and their inventory/availability of certified equipment.
• We’d like your responses by May 15, and FAA will share an analysis of the plans at the NAC meeting scheduled for June 27 in DC.
• Concerning regional jets, we plan to have a more targeted effort later this year focusing on regional jet equipage, and we’ll have more details on that soon. However, we do want all of the mainline carriers to include, in your updated plans submitted to MITRE, how you are working with your codeshare and regional partners on equipage plans.

**Northeast Corridor**

• Turning to the Northeast Corridor, it’s worth noting that 56 percent of the operation into LGA are regional aircraft, and they are not equipped with NextGen technology
• Dave *(Bronczek)*, a year ago you issued the challenge to the NAC – a call to action for improving the Northeast Corridor.
• We have made significant progress in the Northeast Corridor with respect to the NAC’s Phase 1 recommendations.
• We have already completed our analysis for lowering the minima at PHL during Simultaneous Converging Instrument Approach operations and expect to have revised procedures published this summer.
• New York Center has implemented redesigned airspace and completed designs for realigned offshore airways to further optimize airspace throughput for all NY Metro traffic departing or arriving through offshore airspace.
• It’s important to recognize that the FAA and our industry partners have been focused on balancing “pushing the envelope” while also identifying risks and conditions – and the benefits – that contribute to operational viability.
• Teri is here to give us a staffing update to give us an additional piece of context.

STAFFING UPDATE
[Teri Bristol, see attached]

CLOSING

• The Secretary often reminds me that our efforts in this DOT are directed by the following guiding principles: Safety, Innovation, and Infrastructure.
• NextGen is rooted in all three principles, and if we can deliver, a lot can be said for what we’ve accomplished together.
• We’ve got a full plate, but what we’ve heard shows that we’re making real progress, with real action, and real results.
• I want to thank you again for attending today, and for pouring your energy into the NAC, the NAC SC, and the Working Groups.
• With open communication and collaboration, working together we can continue to achieve real progress, real action, and real results.
• This ends the FAA Report.
Approved by the NextGen Advisory Committee March 2018

Priorities for Improving Operational Performance in the Northeast Corridor through CY2021

Report of the NextGen Advisory Committee in Response to a Tasking from The Federal Aviation Administration

March 2018
Executive Summary

In February 2017, the NextGen Advisory Committee (NAC) identified the importance of modernizing air transportation through the application of NextGen in the Northeast Corridor (NEC). Delays in the NEC account for nearly 50% of all delays in the entire National Airspace System (NAS)\(^1\), and since so many scheduled flights go through the NEC, improvement in its performance impacts the entire NAS and operations around the world. In June 2017, the NAC delivered “Goals and Priorities for Improving Operations in the Northeast Corridor Phase One” which identified goals for the NEC. The desired outcomes are:

- Enhanced airport and airspace throughput in all weather conditions
- Predictable departure and arrival times for passengers
- Reduced number and duration of delays
- Good for the environment: noise mitigation and reduced emissions

This effort will only be successful if these outcomes are achieved with no degradation to safety.

In October 2017, the NAC approved “Joint Implementation Commitments for Improving Operations in the Northeast Corridor Phase Two - Interim Report” which identified an initial set of capabilities and associated commitments for the next 18 months (through March 2019). Following the NAC meeting in October 2017, the NEC NIWG has worked diligently to define the next set of initiatives and commitments for the NEC, to be included in the “NextGen Joint Implementation Plan CY2019-CY2021.” As a starting point to these deliberations, the NEC NIWG has articulated ten key operational needs. These operational needs map directly to the goals and capability objectives identified in the NEC Phase 1 report, and address the NAC’s request to have a clearer understanding of the issues that recommended initiatives will address. The ten operational need areas are noted below, grouped into three categories:

**Deconfliction of airports**

- Improvement for constrained NEC departure routes - during normal and severe weather operations
- Address loss of airport throughput due to airport/airspace interactions when arriving LGA 13
- Address loss of airport throughput due to airport/airspace interactions when arriving LGA 31
- Improvement in arrival throughput at EWR and delay reduction (i.e. Ground Delay Programs)
- Provide satellite airport access to NY area airspace and deconflicting satellite operations with the major airports where possible

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\(^1\) Source: FAA analysis of FY2017 OPSNET Delay by Region/Airport and Causal Factor
Enhancement of airport and airspace throughput

- Provide full utilization of available LGA capacity
- Improvement of JFK runway usage and delay reduction
- Improvement of PHL runway usage and delay reduction
- Provide reduced separation and spacing and improved access to NEC airports

Improving the balancing of demand and capacity in NEC traffic flow

- Evolve TFM to incorporate data-driven decision-making to better manage demand/capacity imbalances in the NEC

Finding solutions to these operational needs requires focus and clarity of purpose. FAA and Industry resources are limited, and must be centered on the initiatives that will provide widespread benefit to the operation. Interconnectivity of activities must be considered in the recommendation of any initiative. To address these operational issues, Industry has proposed a set of initiatives (detailed later in the report) as a mid-term (March 2019 to December 2021) plan for the NEC, building on the pre-implementation and implementation commitments taken in the NEC Phase 2 Interim Report. These initiatives were taken from a list of over 100 concepts and ideas generated as part of the initial NEC Phase 2 deliberations.

This reduced set is intended to be a cohesive and integrated plan. The proposed items are consistent with the FAA’s iTBO plans, which was discussed at length with the NEC NIWG. This draft set of initiatives assumes that milestones through March 31, 2019 are proceeding and are unaffected. The NEC NIWG Industry members acknowledge that multiple initiatives noted in this report are expected to begin with feasibility assessments that can lead to actual implementation timelines. There is agreement that PBN is a tool for solving problems and should be pursued.

The FAA is currently conducting internal reviews of these proposed initiatives and joint commitments will be delivered to the NAC in June 2018. The proposed set of initiatives must be considered in relation to existing commitments, and other factors such as operational feasibility, compatibility with FAA acquisition efforts, resource planning (including staffing and procedure development requirements), and community involvement. Discussion of the FAA’s TBO concept, iTBO plan, and the Community Involvement strategy are included in the report to reflect these critical considerations. An update on airport enhancements occurring within the NEC is also included.

FAA staffing and other resource limitations continue to be a significant challenge in the NEC, particularly at the New York facilities. The FAA is making progress in addressing these concerns, but the NEC NIWG recognizes that the pervasiveness of this issue will limit effectiveness of any operational enhancements proposed by the group.
The NEC NIWG believes that PBN is part of the overall solution approach, and that key decisions concerning equipage must be data driven. These decisions include leveraging the equipage that already exists within the NEC, validating the level of equipage that is needed, incentivizing equipage, and implementing tools to address mixed equipage. The report includes discussion of what additional efforts are required to further these discussions collaboratively in a productive consensus environment.

Similarly, other advanced technologies and concepts may be beneficial to the NEC, and the NAC has asked the NEC NIWG to include these options. The deliberations and recommendations of the Advanced Technology subgroup around four key capabilities, Ground-Based Augmentation System, Enhanced Flight Vision Systems, Cockpit Display of Traffic Information (CDTI), and Flight Interval Management, are included in the report.

Finally, this report includes the initial elements of a measurement plan for the NEC NIWG. During the October 2017 meeting, several members of the NAC questioned how results were going to be classified and measured. The identification of the operational needs areas provide an outline of the problems to be addressed, and the starting point for a measurement plan. Additionally, the Joint Analysis Team (JAT), a group of FAA and industry experts that examines performance impacts and benefits that can be attributed to the implementation of NextGen capabilities, has developed an initial measurement plan tied to the March 2019 implementation commitments. A summary of this plan is included in this report.

Background/Introduction

In its February 22, 2017 meeting, the NextGen Advisory Committee (NAC) reached consensus to move forward with a tasking to focus on implementing NextGen in the Northeast Corridor (NEC) (Washington, DC/Baltimore, Philadelphia, New York and Boston airports and associated airspace). During the Committee’s deliberations, members recognized that making continuous improvements to the system in the Northeast Corridor operationally benefits the entire US aviation system. They agreed that the work should start with defining what is included in implementing NextGen in the Northeast Corridor, highlighting the need for addressing the technical, operational and community issues that must be identified up front and then mitigated through the NAC collaborative process.

The Federal Aviation Administration (FAA) formally tasked the NAC in April 2017\(^2\) (Appendix D) to develop recommendations for the collective set of FAA, airport and operator initiatives that focus on implementing NextGen in the Northeast Corridor. Recommendations were developed by the NEC NextGen Integration Working Group (NIWG).

This report responds to Phase 2 of the task request:

\(^2\) Tasking letter dated April 13, 2017 from Ms. Victoria Wassmer to Margaret Jenny, RTCA President.
Use the deliverables in Phase 1\(^3\) to define joint implementation commitments for the Northeast Corridor, including government and industry milestones, and define how implementing those priorities would lead to measurable benefits. Subsequent to implementation, ensure benefits are measured.

Specifically, the industry and the FAA are working collaboratively to identify implementations for March 2019 to December 2021 that will be prioritized based on the benefits, readiness and availability of resources to implement. These actions build on the previous recommendations\(^4\) that are being implemented in the October 2017 to March 2019 timeframe and are driven by the priorities documented in this report.

Each implementation includes:

- Description of the Initiative/Implementation/operational capability
- Benefit(s) Expected from the Implementation of the capability
- Key Risks
- Timeline and Commitment by FAA/Industry (Addendum for NAC consideration in June 2018)

Methodology

Industry and FAA representatives jointly led development of this report while the FAA’s Air Traffic Services managed coordination and facilitation of discussions with NEC ATC facilities.

Operators and airports in the NEC NIWG collaboratively developed a focused set of high priority operational needs for the NEC. Additionally, industry operators and airports recommended which needs and associated initiatives should be focused on and sequenced first. This input from industry was a primary driver of identifying implementation priorities for the NEC. Each industry operational need is detailed in the body of this report.

Additionally, the NIWG pursued multiple parallel efforts (listed below) to inform NEC priorities and this recommendation. This included:

- The NEC NIWG discussed concepts for advancing RNP and identified specific activities that would inform the aviation community of the benefits of advanced NextGen operations under varying resource, funding and equipage scenarios.

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\(^3\) Phase 1 Tasking approved by the NAC on June 28, 2017: “By June 2017, define success in terms of benefits to include determining how benefits will be measured. Identify opportunities most likely to lead to success and identify hurdles that could result in implementation challenges. The emphasis should be on opportunities that can be implemented in less than 18-months. Implementations of up to three years may also be considered.”

\(^4\) “Joint Implementation Commitments for Improving Operations in the Northeast Corridor Phase Two - Interim Report”, approved by the NAC in October 2017
• The FAA reviewed its plans to migrate to Trajectory Based Operations (TBO), including initiatives that may be targeted for the NEC as a part of Initial TBO (iTBO).
• An Industry-FAA sub group evaluated four Advanced Technologies options and provided recommendations to the NEC NIWG about which hold most promise for the NEC.
• An NEC NIWG sub group engaged Airport operators in the NEC to understand and document airport infrastructure priorities.
• The FAA solicited feedback from the following: Northeast Corridor facilities, Program offices and Headquarters management. The feedback was shared in an iterative manner with the NIWG, allowing for industry engagement and discussion with the FAA. The NIWG process was collaborative and productive.
• The FAA and industry discussed the key principles on community involvement, including briefings from the ATO Community Involvement Manager for Airspace Projects and a review of the recommendations made from the NAC to the FAA in June 2016.
• The NEC NIWG reviewed the operational needs and the information above to collaboratively identify the set of priorities for the NEC through the end of Calendar Year 2021. Specific pre-implementation, implementation and industry milestones associated with these priorities will be provided to the NAC in June 2018.

NEC Industry Priorities for Operational Needs through End of CY2021

The industry members of the NEC NIWG identified a set of 10 operational needs that are detailed in this section. For each of these consensus-based priorities, an explanation of the need is included along with the benefits and respective risk. The FAA and industry will subsequently develop an addendum for the report with specific pre-implementation, implementation and industry milestones to capture as much of the benefits as feasible, given the associated risks.

Benefits of Improving Performance in the NEC

The NEC NIWG has identified goals, benefits and initial implementations for improving performance in the Northeast Corridor. The Phase 1 NEC report approved by the NAC in June 2017 identified three tiers of operational benefit for the NEC:

1. Improve execution of today’s operation in the NEC
2. Operate today’s flights more efficiently
3. Grow the capacity and schedule

The Phase 1 NEC study identified the following capabilities as highest priority to achieve these benefits. These priorities align with this report’s detail on the industry’s operational needs for the NEC:

• Deconfliction of Airports
• Improving Airport/Airspace Throughput
• Improvement of Flow Management Capabilities

Finally, the NEC NIWG identified the following metrics as those that best measure the benefits in the NEC:
• Completion Factor
• Delay versus Schedule
• Block Times
• Throughput

Implementation Risks
The NEC NIWG identified the following set of risks\(^5\) as critical to planning implementations between now and the end of CY2021 These guided the work of developing the 10 operational needs. These were originally identified in Phase 1 and enhanced in the subsequent work:

\(^5\) These are similar to those identified by Task Force 5 and the NAC 2013 Prioritization.
\(^6\) Industry members have reviewed and endorse FAA actions to improve staffing levels. Additionally, industry members have additional perspectives on how it may support improvement of staffing and these will be shared with the NAC.
\(^7\) Balancing the correct level of PBN capability to address the intended goals for the implementation.
Industry Consensus on Operational Needs

Operators and airports in the Northeast Corridor collaboratively identified their highest priority operational needs between March 2019 and the end of CY2021. The following operational needs for the NEC represent the industry’s perspective on the highest priority and most vexing challenges in the NEC to achieving the benefits reviewed above. Each need is further detailed below:

Deconfliction and Throughput Focused Operational Needs

- Improvement for constrained NEC Departure Routes - During Normal and Severe Weather Operations
- Address loss of Airport Throughput due to Airport/airspace Interactions when Arriving LGA 13
- Address loss of Airport Throughput due to Airport/airspace Interactions when Arriving LGA 31
- Improvement in Arrival Throughput at EWR and Delay Reduction (i.e. GDPs)
- Provide satellite Airport Access to NY Area Airspace and Deconflicting Satellite Operations with the Major Airports where possible

Growth Focused Operational Needs

- Provide full Utilization of Available LGA Capacity
- Improvement of JFK Runway Usage and Delay Reduction
- Improvement of PHL Runway Usage and Delay Reduction
- Provide reduced Separation and Spacing and Improved Access to NEC airports

Data Driven Traffic Flow Management

- Evolve TFM to Incorporate Data-Driven Decision-Making to Better Manage Demand/Capacity Imbalance in the NEC

Detail on Operational Needs

Each operational need is discussed in further detail below, including qualification of the expected benefits (as defined in the NEC Phase 1 Report) and the implementation risks (as defined above). Note that addressing each of the operational needs below is expected to require community involvement. The approach to this is detailed in the section later in this report titled ‘Community Involvement for NEC Implementations’.

Constrained NEC Departure Routes – During Normal and Severe Weather Operations

Departure route agility for both operators and air traffic is a significant challenge in the NEC, given the proximity of airports all contending for the same departure airspace. When convective weather drives periodic closing or constraining of departure corridors, the problem

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8 During the discussions, current tactical needs were also identified.
is exacerbated, especially in the New York area. When this occurs, departure queues develop at airports driving surface congestion and, at times, impacting the flow of arriving aircraft to the gate. Additionally, there is opportunity to expedite the re-opening of closed or constrained departure routes. Impacts to departures can result in operational complexity and significant customer disruptions.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Utilization of all available departure options to maintain departure throughput and flow</td>
<td>• Airspace limitations to adjust departure routes</td>
</tr>
<tr>
<td>• Reduction in departure and arrival delay and improved predictability</td>
<td>• Training and cultural issues with traffic management and operator personnel to adjust to alternate departure routes</td>
</tr>
<tr>
<td>• Reduced last minute cancellations due to exceeding FAR 117 crew duty time requirements, improving completion factor</td>
<td></td>
</tr>
</tbody>
</table>

**Loss of Airport Throughput due to Airport/airspace Interactions when Arriving LGA 13**

When LGA arrives on runway 13, the LGA arrival stream conflicts with operations at EWR or TEB. The sharing of airspace between LGA, EWR and TEB reduces throughput at all the airports.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Deconfliction enables LGA, EWR and TEB to operate independently, improving each airport’s throughput</td>
<td>• Dependent on positive results of feasibility and/or safety assessments –of approach transitions to LGA ILS 13 or other approaches to LGA 13 that allow for appropriate separation between operations at all three airports and which aircraft can reliably operate</td>
</tr>
<tr>
<td>• Reduces delay, particularly large ones, and improves Completion Factor</td>
<td>• High use of regional jets may complicate use of RNP solutions</td>
</tr>
<tr>
<td>• Allows use of LGA runway 4 for departures to assist balancing environmental effects</td>
<td>• Resources at air traffic facility and in procedure development to design and develop a new approach procedure or transition</td>
</tr>
</tbody>
</table>

**Loss of Airport Throughput due to Airport/airspace Interactions when Arriving LGA LOC-31**

When LGA arrives on the localizer to runway 31, the LGA arrival stream conflicts with airspace used for JFK arrivals. This forces JFK to arrive on 31’s and reduces JFK’s overall throughput.
• Allows JFK to balance its operation to favor arrival or departure throughput, according to demand
• This reduces average Delay and improves Completion Factor at JFK
• Multiple approach reduces flying miles and allows balancing of environmental effects

• Dependent on positive results of feasibility and/or safety assessments – technical feasibility of an approach to LGA 31 that allows for appropriate separation from JFK arrival airspace
• Availability of aircraft equipage to operate a procedure that reliably deconflicts LGA 31 arrivals from JFK arrival airspace
• Resources at air traffic facility and in procedure development to design and develop a new approach procedure or transition

### Improvement in Arrival Throughput at EWR and Delay Reduction - i.e. Ground Delay Programs (GDPs)
Scheduled demand has increased since October 2016 when EWR was no longer a slot-controlled airport. To reliably operate the daily schedule at EWR, two arrival runways are required. However, there has been no consistent utilization of a second arrival runway (4L/22R or 11/29), and GDPs are regularly issued at EWR, even on clear weather days. Controller staffing may be a contributing factor to the ability to utilize a second runway at EWR.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improved Arrival Throughput at EWR</td>
<td>• Technical feasibility of deconflicting flows to second arrival runway from other traffic in the New York area</td>
</tr>
<tr>
<td>• This results in reduced arrival delay,</td>
<td>• Staffing can be a current limitation to utilization of a second runway</td>
</tr>
<tr>
<td>improved completion factor and greater</td>
<td></td>
</tr>
<tr>
<td>schedule reliability</td>
<td></td>
</tr>
</tbody>
</table>

### Satellite Airport Access to NY Area Airspace and Deconflicting Satellite Operations with the Major Airports where possible
There are 3 major airports and 2 busy satellite airports within a 20-mile radius of New York as well as multiple other satellite airports within the terminal airspace. While procedures have been developed over time between major and satellite airports to allow independent operations, there are still instances where flows will affect each other between these airports. At times, operations from satellite airports are subject to lengthy delays due to conflicts with the major airports in the area. There may be further opportunity to utilize NextGen technology and procedures to enable aircraft operating to or from satellites to access or depart these airports independently of the major airports, especially through newly designed procedures to deconflict the satellite airports from major airports.
### Benefits
- Expedite departures from satellites without waiting for gap in primary flows
- Reduces arrival delays due to increased intrail spacing
- Increases access to operationally advantageous runways
- Allows routing that would primarily overfly industrial areas and use of preferred noise abatement procedures

### Risks
- Technical feasibility of deconflicting flows between major and satellite airports based on available airspace and aircraft capability
- Availability of procedure development resources to develop procedures that are deconflicted between airports
- Staffing can be a current limitation to handle potential increases in satellite traffic

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### Full Utilization of Available LGA Capacity
Most days of the week, LGA operates a schedule that is at the airport’s capacity in visual conditions. Even in good weather, any variation in operation or airport configuration can cause GDPs, ground stops, holds and departure delays due to missed arrival or departure slots. Utilization of metering and sequencing tools to ensure a consistent flow of arrival aircraft to LGA would help limit any disruptions in the LGA operation.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain use of available Throughput, resulting in reduced arrival and departure queuing</td>
<td>Staffing resources available to adapt metering and sequencing tools to LGA operation</td>
</tr>
<tr>
<td>This reduces average Delay and improves reliability</td>
<td>Training and cultural issues to utilize metering and sequencing tools</td>
</tr>
<tr>
<td>Supports dispersion of Runway 13 departures to assist balancing of environmental effects</td>
<td></td>
</tr>
<tr>
<td>Reduced controller workload</td>
<td></td>
</tr>
</tbody>
</table>

### Improvement of JFK Runway Usage and Delay Reduction
JFK has opportunity for further utilization of its available runways. Departure and metering delays are experienced due to the shared departure runways. There are potential alternative runway configurations and supporting procedures for JFK that should be considered.
<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improves airport Throughput</td>
<td>• Controller staffing in the TRACON and tower to feed and accept a higher rate of traffic at JFK</td>
</tr>
<tr>
<td>• This reduces average Delay, improves Predictability and may improve Block Times</td>
<td>• Availability of TRACON airspace for arriving/departing aircraft</td>
</tr>
<tr>
<td>• Profile descent procedures enable more efficient flows with less noise impact</td>
<td></td>
</tr>
</tbody>
</table>

**Improvement of PHL Runway Usage and Delay Reduction**

PHL has an opportunity for modernizing procedures due to changes in the US Standard for Terminal Instrument Procedures (TERPS) that could enhance utilization of runways at PHL. Additionally, airfield improvements are possible to improve staging of departing aircraft to better feed demand to the runways based on constraints in the airspace.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improves airport Throughput</td>
<td>• Availability of aircraft equipage to operate NextGen procedures</td>
</tr>
<tr>
<td>• This reduces average Delay, improves Predictability and may improve Block Times</td>
<td>• Resources at air traffic facility and in procedure development to design and develop a new approach procedure or update existing ones based on new criteria</td>
</tr>
</tbody>
</table>

**Reduced Separation and Spacing and Improved Access to NEC airports**

Given the density and complexity of the NEC operations, any new approaches or waivers in the NAS intended to provide reduced separation should be considered in the NEC. This would provide improved approaches with lower minima and less chance of a go around while maximizing use of available airfield capacity.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improves airport Throughput</td>
<td>• Dependent on positive results of technical and safety feasibility assessments</td>
</tr>
<tr>
<td>• This reduces average Delay, improves Predictability and may improve Block Times</td>
<td>• Availability of aircraft equipage to operate modern NextGen procedures</td>
</tr>
<tr>
<td></td>
<td>• Resources at air traffic facility and in procedure development to design and develop a new approach procedure or update existing ones based on new criteria</td>
</tr>
</tbody>
</table>

**Evolve TFM to Incorporate Data-Driven Decision-Making to Better Manage Demand/Capacity Imbalance in the NEC**

When there are weather constraints in the NEC, TFM works to balance demand and capacity requiring setting appropriate arrival and departure rates and delivering aircraft at that rate.
There is industry need to leverage ‘big data’-driven tools and advanced analytics to enhance rate setting. Additionally, there is need to define a clear approach to implement use of such data in the traffic management and operational environment in collaboration with aircraft operator and ATC front line personnel. It is important for operators and airports to access the same data utilized to assist in traffic management decisions to inform their corresponding operational decisions.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improves airport and airspace throughput, particularly during severe</td>
<td>• Potential big data analytics tools are not necessarily on the current</td>
</tr>
<tr>
<td>weather</td>
<td>Collaborative Air Traffic Management (CATM) implementation path and</td>
</tr>
<tr>
<td>• This reduces average Delay and improves reliability as well as</td>
<td>are at risk of being unfunded in the future</td>
</tr>
<tr>
<td>Completion factor</td>
<td>• Training and cultural issues with traffic management and operator</td>
</tr>
<tr>
<td>• Improves industry situational awareness</td>
<td>personnel to utilize the data and tools to make decisions</td>
</tr>
<tr>
<td>• Enables the success of other initiatives based on this as a</td>
<td></td>
</tr>
<tr>
<td>foundational capability</td>
<td></td>
</tr>
</tbody>
</table>

Sequencing the Priorities
A list of potential implementation initiatives that could impact these operational needs was identified and is included in the detail in Appendix C. Stakeholders recognize that there are numerous challenges to implementation, including, but not limited to, availability of funding and resources. The ten operational needs identified above represent industry focusing in on the most important needs; hence, all are deemed important. However, given well-understood resource challenges, industry provided further input on which initiatives it would recommend sequencing and implementing first. This is presented below with further detail in Appendix C:

<table>
<thead>
<tr>
<th>Initiative Category</th>
<th>Initiative Specifics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Driven TFM</td>
<td>• Collaborative SOP around existing available or prototype capabilities (IDRP,</td>
</tr>
<tr>
<td></td>
<td>RAPT, NOD w DRS) for use during SWAP 2018</td>
</tr>
<tr>
<td></td>
<td>• Emerging applications and capabilities for opportunities within iTBO scope/waterfall</td>
</tr>
<tr>
<td></td>
<td>for 2018+</td>
</tr>
<tr>
<td>Multiple Airport Deconflict</td>
<td>• RNAV transition to ILS LGA13, and RNAV LPV, RNP and/or GLS to LGA13</td>
</tr>
<tr>
<td></td>
<td>• Modified LGA/EWR airspace to deconflict EWR29 GPS, and new GPS</td>
</tr>
<tr>
<td></td>
<td>and RNP approach</td>
</tr>
<tr>
<td></td>
<td>• Multiple PBN approaches for LGA31, including RNAV (GPS) transitions</td>
</tr>
<tr>
<td></td>
<td>to existing procedures and exploitation of RNAV to LOC RWY 31</td>
</tr>
</tbody>
</table>
| Crosscutting Departure Throughput | • PDRR with technology and process changes in place  
| | • Expanded low altitude and escape route structure  
| | • Enhanced management for fix/route closure during irregular ops  
| | • ZDC09 (MAP changes, splitting sector)9  
| | • Vertical climb escape route/high performance escape route  
| | • ACP and ZNY offshore routes9  
| | • TBFM metering and pre-scheduling  
| Metro NY Airport Throughput and Efficiency | • Existing tools/investments to increase airport throughput: CRDA for JFK, high-speed turn-offs at EWR  
| | • Existing PBN procedures modified as needed to increase use and reduce pilot and controller workload  
| | • Tools to assist managing final approach spacing  
| LaGuardia | • Dispersal headings (TNNIS, NTHNS, GLDMN)  
| Kennedy | • EoR for 13R  
| | • ROBER OPD to 22L  
| | Teterboro | • RNAV SID TEB19  
| | • RNAV approach procedures for TEB19 and TEB24  
| Newark | • 22L and 29 arrivals  
| | • 4L visuals  

Addressing the operational needs through the initiatives noted above is expected to deliver benefit against industry metrics such as Completion Factor, Delay and Block Time average and variability as well as Throughput.

**Initial Trajectory Based Operations (iTBO)**

The FAA is implementing new capabilities, which leverage investments made by the FAA and operators in support of the Performance-Based Navigation (PBN) NAS Nav Strategy and other enabling infrastructure, to transform the National Airspace System (NAS) to Trajectory Based Operations (TBO) as part of the Next Generation Air Transportation System (NextGen) program.

**Introduction to TBO**

TBO is an air traffic management method for strategically planning, managing, and optimizing flights by using time-based management (TBM), information exchange between air and ground systems, and the aircraft’s ability to fly precise paths. The trajectory includes a path between origin and destination with predicted crossing time estimates at key points along the path which are much more accurate than the estimates used today for strategic planning. Use of time provides a common planning reference across all phases of flight, including pre-departure.

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9 These initiatives address overlying airspace constraints and have wide-spread benefit to the whole NEC
resulting in gate-to-gate operational improvements. The trajectory facilitates integration across Air Traffic Management (ATM) domains, enables the FAA to account for user objectives, and allows for more collaborative and flight-specific solutions in response to NAS constraints. This represents a great improvement over today’s strategic planning initiatives and tactical flow management techniques and addresses many of today’s operational shortfalls. Altogether, TBO is well-aligned with the operational needs that have been identified by industry as part of the NEC NIWG.

TBO Background
The transition to TBM, a key part of TBO, is outlined in a collaborative FAA and Industry document, the PBN NAS Navigation Strategy, which was endorsed by the NAC in 2016. That document outlines a roadmap for enabling the efficiencies available through PBN equipage.

In October 2016, a Time, Speed, and Spacing (T/S/S) task group provided recommendations towards achieving the commitments outlined by the PBN NAS Navigation Strategy. Those recommendations were approved by the NAC in October 2016. A core principle described in that report is that a transition to a time-based system is necessary to enable higher percentages of PBN operations; the goal is to provide speed or time control to keep flights on their optimal path. Achieving this goal is dependent upon improved flow management which requires leveraging existing and future decision support tools for controllers and traffic managers, as well as new flight deck technologies. Success also requires effectively addressing the large cultural shift that will be experienced by the ATM and operator workforces. The recommendations made in the T/S/S report include the need to clarify the end state vision, the continued deployment of enabling capabilities, and developing a plan to institutionalize the operational culture shift.

TBO is expected to result in more efficient use of system capacity by maximizing airspace and airport throughput, improved operational predictability through more accurate gate-to-gate strategic planning, enhanced flight efficiency through integrated operations, and increased operational flexibility through increased user collaboration regarding trajectories and priorities. TBO objectives are also consistent with the tenets of the FAA’s NextGen Segment Implementation Plan (NSIP) which states that, “the overarching objectives for the future remain the same — maximizing airspace capacity with more sophisticated and seamlessly integrated information about the future position of aircraft at a given time — while maintaining the safest air travel possible.” Additionally, the NAC has emphasized the need for achieving visual meteorological conditions (VMC) performance in instrument meteorological conditions (IMC) and the TBO vision will support initiatives and new procedures that support that goal.

iTBO and the NEC
The FAA has prioritized the North East Corridor (NEC) for initial TBO implementation, which is expected to span now through 2022. The success of TBO in the NEC will be dependent on implementation of multiple elements, including operator capabilities. These elements include
implementation of PBN procedures and aircraft operators equipping to use those procedures; operator provision of data elements and trajectory options which reflect flight status, intent, and preferences; data communications between the air and ground; and the use of Decision Support Systems like Time-Based Flow Management (TBFM), Terminal Flight Data Manager (TFDM), and Traffic Flow Management System (TFMS).

The FAA’s implementation strategy for TBO includes assessing the current status of TBO capabilities in the NEC, reviewing current deployment waterfalls for TBO capabilities, and then identifying gaps between the desired end state and what is currently planned. FAA Headquarters is working with the field facilities to develop a plan for initial TBO capabilities in the NEC. This will inform selection of the commitments proposed for the NEC in the March 2019-December 2021.

iTBO Capability Examples

Decision support tools for controllers and traffic managers are critical in evolution of this transition to TBM, particularly the expanding set of metering tools and applications, being operational in ATC facilities across the NAS. The TBFM system is the primary platform for implementing TBM in the EnRoute environment. The TBFM system provides traffic managers an integrated timeline for flights destined to a particular airport or an EnRoute constraint point. The timelines also include the amount of adjustments (or delay) each flight will need to take based on evolving capacity constraints. As opposed to traditional miles-in-trail (MIT) restrictions which impose a static spacing to all flights in a flow, the TBFM system will assign delay only where needed for accomplishing integrated flow management.

When airborne metering is active, TBFM provides information to controllers regarding how much delay specific flights need to absorb before entering the TRACON airspace. This means that delay is redistributed to more fuel-efficient altitudes in EnRoute airspace where trajectory adjustments can be made at higher altitudes and over a longer distance. TBFM airborne metering has been available for EWR arrivals for over a decade; however, there is a need to update and revise the metering adaptation and practices to fully leverage that capability. Additionally, the FAA is considering the application of TBFM airborne metering for other NY airports, such as LGA.

TBFM also provides information to Tower controllers for flights that are departing into a constrained flow. TBFM estimates the appropriate runway departure time that will ensure a flight will merge smoothly with the overhead airborne stream via the Integrated Departure Arrival Capability (IDAC). IDAC was deployed to 6 Towers in the NEC in December 2017 and is used with TBFM for departure operations; these goals were captured by the within 18-month NEC commitment set. The use of IDAC is one element in the eventual subsumption of the Departure Sequencing Program (DSP).

The Converging Runway Display Aid (CRDA) is a situational awareness tool that assists a TRACON controller with synchronizing two streams of traffic by displaying ‘ghost’ targets,
allowing them to understand the relationship of merging/converging flows sooner so that speed control can be more effectively applied. This tool allows some airport configurations to be used in situations or conditions where it would otherwise not be possible. It can be used more effectively when arrival flows are metered—it helps TRACON controllers fine-tune spacing across flows for converging and crossing runway operations. It is also used with ATPA to tighten up in-trail spacing on final approach. For this reason, the FAA is also considering commitments regarding applying use of CRDA to support a number of airport configurations.

Implementation of TBO aligns with many of the within 18-month NEC commitments, as well as the 18-48 month commitment set currently being considered encompassing new PBN procedures, improved use of existing flow management capabilities, and implementation of new flow management capabilities. These commitments both address near-term operational needs and establish the core foundation for achieving initial TBO to/from NEC airports.

**Advancing RNP at New York Airports**

In its October 2017 meeting, the NAC requested the NEC NIWG include stretch goals to utilize NextGen capabilities and strategies. Performance Based Navigation plays an instrumental role in the NEC solution space, as evidenced in both the Industry sequencing of priorities and in the FAA’s TBO strategy. While utilizing existing RNAV capabilities provides an essential foundation to address needs in the NEC, particularly in the near term, the NIWG recognizes that utilizing advanced navigation capabilities may be necessary to resolve the broader issues in the NEC. For example, the tighter containment of advanced RNP\(^{10}\) could provide solutions for airport deconfliction that cannot be afforded by RNAV solutions. The NEC is considering how to balance commitments that utilize existing capabilities to provide near-term relief to NEC challenges with expediting achievement of advanced RNP operations in the NEC\(^{11}\).

Advanced RNP is important for meeting the needs of NEC stakeholders for the established goals of increasing overall throughput, completing the flight, arriving according to schedule and delivering reliable departure and arrival times. This can also have positive impacts on the environment and safety.

Implementation and effective use of advanced RNP is dependent upon at least three key actions to mitigate risks: 1) having published procedures developed with community involvement (further discussed in the Implementation Risks and Community Involvement\(^{10}\))

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\(^{10}\) Defined in the FAA’s PBN NAS Navigation Strategy 2016 as: “Advanced-RNP functions provide more capability than default PBN procedures. Advanced-RNP functions include radius-to-fix (RF) legs, parallel offsets, RNAV holding, scalable RNP, fixed radius turns (FRT) and Time of Arrival Control.”

\(^{11}\) In the October report to the NAC, the NIWG identified two examples of PBN concepts in the NextGen Initiatives section of its Phase 2 Interim Report and has developed more detail:

- Conduct feasibility assessment of EoR simultaneous operations to 13R RNP and 13L ILS at JFK
- Assess concept to allow simultaneous operations at widely spaced approaches to different airports
sections), 2) having critical mass of appropriately equipped aircraft, and 3) availability of controller and ATCSCC decision support tools to manage aircraft flows. The pace at which industry and FAA achieves advanced RNP operations will be directly linked to these three areas.

PBN remains a broadly supported and foundational element of NextGen. Implementation of fully leveraged PBN capabilities, such as Advanced RNP in the NEC is limited with mixed equipage fleets by the ability to segregate aircraft equipped for advanced RNP operations from non-equipped aircraft, particularly on single runway operations. At LGA airport, for example, the level of non-equipped aircraft currently poses a challenge to managing the flow of aircraft for advanced RNP operations. At JFK and EWR, which have greater equipage and possible use of a second arrival runway, advanced RNP may be more feasible sooner.

Objective data and analysis are needed to inform the extent to which advanced RNP operations are feasible in mixed equipage environments. Data can identify the threshold of equipage required to reliably operate advanced RNP in the NEC (noting that different airports and operations may have different thresholds). Additionally, data can inform whether thresholds change with the implementation of certain controller decision support tools such as sequencing tools.

Operators continually evaluate their fleets to determine whether to equip their aircraft with the capability to operate advanced RNP. Some operators have fully equipped while others have not. Additionally, some, but not all, equipped operators have received operational approval to fly advanced RNP.

Data and analysis are also needed to inform decisions about modernizing equipment. Operators, particularly those whose networks are served by aircraft not equipped for advanced RNP operations, seek objective data to substantiate RNP related benefits and thus investments. Without this data, the benefits of advanced RNP airspace procedures cannot be substantiated. Conversely, operators who have modernized fleets are not able to consistently conduct advanced RNP operations with their capable aircraft.

Data would inform operators developing business cases to modernize non-capable aircraft to participate in advanced RNP operations, and the NEC NIWG is considering commitments to developing such data. This would help ensure that the benefits are coordinated between stakeholders and commensurate with the investment. The NEC NIWG recognizes that any commitment regarding generation of such data needs to be bounded to ensure the information is timely.

The high-level data should address questions regarding the viability of advanced RNP. These results would inform operator equipage, FAA policy and airport investment decisions by quantitatively informing the following types of questions:

- What are equipage thresholds to achieving benefits?
- How much benefit do non-equipped aircraft leave on table?
• How much system benefits are sacrificed due to lack of equipage?
• How much benefit is still achievable with mixed equipage?
• How do benefits change given level of resource applied?
• How do benefits change given pace of implementation and acceptance of tools and procedures?

Commitments should include evaluation of operational or financial incentives for equipped aircraft. Operational incentives may include access at certain times of day for aircraft equipped for advanced RNP or exemption from traffic management restrictions. Financial incentives may be similar to those used for the DataComm program.

Both industry and FAA are keenly focused on an approach to advancing RNP that coordinates development of procedures and controller tools with aircraft equipage. The NEC NIWG does not want to implement NextGen procedures, develop new controller tools or add equipage with no operational benefit. Nor does the NEC NIWG seek to create a highly complex or multi-year term modeling requirement that does nothing to further needed decision making. Rather the intent is to encourage a collaborative analysis forum, with the participation of all operational stakeholders, that is focused and delivers timely results (within 12 months). The June report to the NAC will identify any commitments on generation of data and analysis to inform advancing of RNP, including scope and required participation from Industry, Airports, and the FAA.

Advanced Technologies
At its October 4, 2017 meeting, the NextGen Advisory Committee (NAC) requested the Northeast Corridor (NEC) NextGen Integration Working Group (NIWG) to assess if, and/or how to leverage the capabilities of Enhance Flight Visions Systems (EFVS) in the NEC including correlating benefits with varied levels of equipage.

In subsequent discussions by the NAC Subcommittee, the Advanced Technology Subgroup was created to perform this assessment. As the NACSC discussed the NAC request, the inclusion of Flight Interval Management (FIM) or potentially other new capabilities was also suggested for inclusion.

The detailed report is included as Appendix (F). Many of the time frames for the advanced technologies recommendations extend beyond the time frame covered by this report. Certain initiatives will be incorporated in the operational needs as appropriate.

The following summarizes the three areas (four technologies) identified by the Advanced Technology Subgroup:

Ground Based Augmentation System (GBAS) – funded by airports, with technical support from the FAA, and specific equipage for aircraft operators, GBAS offers the potential for immediate benefits (GBAS enables system installation at any airport in the world). By providing
Navigational accuracy to within 1/2 meter, GBAS allows precision approaches where none are currently available, with potential for all weather CAT III capability.

Some aircraft operators have invested in GBAS, however greater airport equipage and FAA support is needed for leveraging benefits from GBAS in the NEC. The NEC is recommending a set of near-term industry and FAA actions that support the delivery of benefits from the operation of the non-Federal GBAS facilities by approving new facilities, developing and publishing GLS approach procedures, training controllers, and providing flight inspection services. The NEC is recommending a set of near-term industry and FAA actions.

**Enhanced Flight Vision System (EFVS)** – EFVS is an electronic means to provide a display of the forward scene topography through imaging sensors and includes display element, sensors, computers and power supplies, indications, and controls. EFVS provides an operational credit to lower required visibility/RVR minima on instrument approaches and significantly increases situational awareness during low visibility operations with some limitations.

EFVS primarily benefits smaller, less capable airports without Cat II/III equipment. At higher density locations, opportunities exist for use to runways without an approach procedure or secondary runways. By providing enhanced flight visibility to perform the visual segment of an instrument approach procedure, properly equipped aircraft can use EFVS to initiate and/or continue any instrument approach procedures utilizing glideslope or VNAV vertical navigation down to touchdown and rollout with weather minimums well below those required for the approach.

Potential exists to change the way the NAS works, particularly the NEC, in relation to weather situations with less than visual approach conditions. EFVS could lower IFR minimums thus maintaining higher runway rates during lower than visual approach conditions.

Further studies are necessary to determine requirements for reaching benefits similar to Cat II/III operations in the NEC, as well as breaking down the relative advantages to primary and secondary airports and how often arrival rates would improve if these benefits did exist. In addition, studies are needed to analyze the effects of mixed equipage aircraft operations in the NEC, including what level of equipage is required to begin realizing significant benefit.

**ADS-B In**

**Cockpit Display Traffic Information (CDTI) Assisted Pilot Procedures (CAPP)** – is the concept that involves enhanced Traffic Collision Avoidance System (TCAS) using ADS-B In data that enable pilots to adhere to a controller’s clearance without visual acquisition and include technology that replaces the pilot’s view to acquire traffic to follow.

The primary potential benefit of these capabilities is stabilizing runway rates even when visibility is not, allowing near VFR arrival rates in IMC conditions with minimal changes, benefiting both aircraft operators and the NAS. CAPP has the potential to improve runway rates during IMC without changing procedural designs or requiring airspace changes.
There are specific issues that need to be evaluated for deployment in the NEC. These include determining whether leading and following aircraft must be on the same approach and how controllers will know if an aircraft is equipped to participate. Modifications to controller automation (e.g. STARS, ERAM) may be needed to include information in the data tag. FAA investment in such modifications may be contingent on the level of operator equipage.

**Flight Interval Management (FIM)** – uses ADS-B In traffic information to provide speed cues to pilots in order to manage inter-arrival spacing. Implementation of FIM is a fundamental change in the way traffic is managed. Pilots will have a new task of following changing speed guidance from avionics. Pilots will not be responsible for separation; their only responsibility will be to follow speed guidance from the avionics. Controllers are responsible for separation.

The goal of IM is to reduce the variation in inter-arrival spacing, thus increasing runway throughput. The more direct control loop enabled by calculation of speed by IM avionics results in a significant reduction in the standard deviation of the inter-arrival rate. This leads to more available capacity, compared to current operations with ATC vectoring and speed assignments. Since IM arrivals end with instrument approach procedures, there is no need to conduct visual approaches to achieve maximum capacity. Maintaining higher arrival rates, similar to VMC arrival rates, will be possible with IM during periods of lower ceiling and visibilities, down to Category 1 approach minimums. Research indicates that FIM system performance may also allow for further increases in capacity.

Issues such as mixed equipage, cultural issues for pilots and controllers, and accommodation of go-arounds and departures from close-in airports must be addressed for the TBO environment. The cost and benefits also needs further definition. The policy and procedures associated with enabling FIM need to be defined. Aircraft operators also need information for the business case to invest in IM capable ADS-B-in avionics.

**Airport Infrastructure Priorities**

Airports within the NEC continue to improve and modernize their infrastructure. In response to the NAC recommendation to pursue initiatives that are more forward leaning, several additional initiatives were identified that could benefit from the collaborative NEC process to advance towards implementation. In general, many of these are projects that were being discussed in various forums, but had not yet advanced to actual, mature projects with planned implementation schedules. The projects have significant potential to contribute to improved operations in the NEC, through connected benefits with improved surface flows or reliable access during poor weather.

Most of these initiatives are identified as pre-implementation, in that further analysis and decision making is needed among stakeholders to reach a decision on proceeding with actual development and the overall scope of the project. This can include benefits analysis to arrive at
an investment decision, stakeholder collaboration on advanced development planning, and revisions to the airport layout plan. Most of these initiatives are industry goals since they involve physical construction on the airport.

<table>
<thead>
<tr>
<th>Airport</th>
<th>Initiative</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOS</td>
<td>Create additional tower space for TFDM equipment to enable surface metering (I)</td>
<td>Massport owned tower space that is leased to FAA ATCT</td>
</tr>
<tr>
<td></td>
<td>Conduct GBAS assessment/evaluation (I/PI)</td>
<td>Benefits assessment for airport investment decision</td>
</tr>
<tr>
<td>JFK</td>
<td>Install non-fed GBAS (I)</td>
<td>PANYNJ installation of GBAS equipment, with initial goals of providing additional resiliency and approach overlays to all runway ends</td>
</tr>
<tr>
<td>LGA</td>
<td>Conduct assessment of departure queue taxiways to feed Runway 27R (I/PI)</td>
<td>Develop benefits assessment and revise airport layout plan, in coordination with stakeholders (airlines, ATCT, FAA)</td>
</tr>
<tr>
<td>PHL</td>
<td>Conduct assessment of additional high-speed exit to improve arrival throughput on Runway 27L (I/PI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conduct assessment of taxiway extensions for end-around operations to improve surface flow (I/PI)</td>
<td></td>
</tr>
<tr>
<td>DCA</td>
<td>Conduct assessment of north end hold pads and stub taxiways to improve surface efficiency (I/PI)</td>
<td>With development of the New North Concourse, reconfigured and expanded hold pads and stub taxiways on the north end could improve efficiency and ease surface congestion</td>
</tr>
<tr>
<td>NEC airports</td>
<td>Conduct benefits assessment of gate docking technologies to improve surface management (PI)</td>
<td>FAA led study with MITRE to assess if more widespread use of gate docking technologies, particularly during convective weather, would significantly improve NEC operations</td>
</tr>
</tbody>
</table>

Although not listed as NEC initiatives, the NEC airports continue to fund and implement significant improvements to their infrastructure (including major airside and terminal development) with support from their airlines and FAA. The airport sponsors and airlines in the NEC have spent over $5 billion combined in the past five years and are anticipated to fund approximately $15 billion over the next five years on critical airport infrastructure. These projects are maturing and will provide significant benefits to the airports’ operation and enhance the overall passenger experience. Since they are already independently progressing towards implementation and may not directly impact airfield and airspace utilization, they were not included as NEC initiatives. Instead, focus on the initiatives identified above is substantive for the NEC process given the upside potential to develop projects that could further improve NEC operations.
Community Involvement for NEC Implementations

An important element for successful implementation of NEC initiatives will be the communication and affirmation of the need for change and the engagement and support of all stakeholders throughout the process. There is a recognition from the FAA, aircraft operators, and airport operators outlined in the June 2016 recommendation\textsuperscript{12} by the NAC that a key step is also the communication and engagement with local communities. We must engage early and often on multiple levels to ensure an understanding of the need for the changes and what they will mean to the community. All of those who are interested in the success of NextGen implementation in the NEC must be involved.

The framework and key principles for conducting community involvement during implementation of NEC commitments will follow the FAA Community Involvement Manual and include the following:

- Throughout the NEC community involvement process, airport operators, aircraft operators, and the FAA are critical partners who are committed to explaining the initiatives and their benefits and in communicating with communities.
- The level of community involvement will be tailored to the initiatives under consideration and the potential impact of specific initiatives. In some cases, this may mean going beyond satisfying applicable legal requirements.
- Successful community involvement activities will leverage community aviation roundtables and other stakeholder groups throughout the NEC.
- Communication with elected officials, local agencies, the public, and other stakeholders on project status will be timely and ongoing. Comments and feedback on specific initiatives from all stakeholders will be considered to inform decision making and project refinements.

Given that the NEC is a collection of multiple initiatives of different types (airspace & procedures, airports, tools, and tactical) across differing timeframes, there should be regular communications regarding NEC activities to ensure that the set of initiatives fits together in a cohesive way and that cumulative noise impacts across all applicable initiatives are addressed.

Part 150 studies\textsuperscript{13} are ongoing as part of a separate process at several locations, but it will be necessary to address any overlaps and dependencies, and coordinate communications strategies.

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\textsuperscript{12} PBN Blueprint Community Outreach Task Group recommendation, June 2016.

\textsuperscript{13} Federal Aviation Regulation, Part 150, Airport Noise Compatibility Planning, is the primary Federal regulation guiding and controlling planning for aviation noise compatibility on and around airports. Part 150 established procedures, standards, and methodologies to be used by airport operators for preparation of Airport Noise Exposure Maps (NEMs) and Airport Compatibility Programs (NCPs) which may be submitted to the FAA.
Joint Analysis Team Evaluation of Impact

The Joint Analysis Team (JAT) is an FAA-Industry collaborative team that evaluates the operational benefits from NextGen implementations. In the October 2017, the NAC approved a report from the NEC that detailed implementation commitments in the NEC through March 31, 2019. These commitments include 8 implementations that are expected to directly impact operational performance in the NEC.

The JAT has developed measurement plans to evaluate the benefits of each of these implementations as they begin to ‘touch the operation.’ A summary of the JAT’s measurement plan for the 8 initiatives is presented below:

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Initial Ops Availability</th>
<th>Supporting Org.</th>
<th>Study Periods(^{14})</th>
<th>Benefits Assessment</th>
</tr>
</thead>
</table>

Further detail on the JAT’s plan to measure these initiatives are covered in a separate document that is available from RTCA. As the NEC NIWG identifies new implementation milestones, evaluation of these will be integrated into the JAT’s measurement plan.

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\(^{14}\) Study period and Benefits Assessment dates may need to be adjusted based on the actual initial ops availability date and data availability; analysis of baseline performance will be conducted and reported on prior to the preliminary reporting

\(^{15}\) May need to compare 2017 to 2019 study periods to eliminate periods with inconsistent use of metering
Appendix A: FAA Tasking Letter
April 13, 2017

Ms. Margaret Jenny
President, RTCA, Inc.
1150 18th St. NW.
Washington, DC 20036

Dear Ms. Jenny:

The NextGen Advisory Committee (NAC) met on February 22, 2017, and agreed to make the Northeast Corridor (NE Corridor) a priority region in the Federal Aviation Administration’s (FAA) ongoing implementation of NextGen. The FAA supports the aviation industry’s recommendation to address improvements in the NE Corridor, defined for this task as the airspace from Washington, D.C., to Boston, including Philadelphia and New York City.

NAC member input received to date underscores the complexity of the NE Corridor in implementing and effectively utilizing NextGen capabilities. Success will require collaboration and consensus among many diverse and competing stakeholders. Consequently, we believe it is essential that stakeholders begin by working together to define what they view as the primary challenges and opportunities, as well as how success will be defined. Given the broader infrastructure program being contemplated by the administration, we would like the NAC to begin work immediately to inform the infrastructure program for improvements in the region.

We all recognize that NextGen requires significant investment from a variety of stakeholders, including the government, as well as those who manage airports and operate aircraft in the aviation system. Here is the question to be addressed by the NAC: What collective set of FAA, airport, operator and community initiatives can improve the NE Corridor?

The FAA requests that the NAC undertake the NE Corridor tasking in the phases outlined below.

- Phase 1: By June 2017, define success in terms of benefits to include determining how benefits will be measured. Identify opportunities that are most likely to lead to success, and identify hurdles that could result in implementation challenges. The emphasis should be on initiatives that can be implemented in less than 18 months. Implementations of up to three years may also be considered.

- Phase 2: By October 2017, use the deliverables in Phase 1 to define joint implementation commitments for the NE Corridor, including government and industry milestones, and
define how implementing those priorities would lead to measurable benefits. Subsequent to implementation, ensure benefits are measured.

The NE Corridor tasking should leverage the 2013 NextGen Prioritization criteria. As appropriate, the tasking should incorporate previous NAC recommendations to the fullest extent possible and leverage previous Tactical Operations Committee recommendations.

The FAA and other aviation stakeholders involved in implementing the NE Corridor initiative have limited resources. The NAC will need to include recommendations on which commitments and/or other existing priorities should be removed from current NextGen Priorities.

It is important to draw on what has worked well in the past and identify how to move forward. We look forward to the opportunity to share lessons learned at the upcoming NAC subcommittee meeting. If I can be of assistance, please contact me or James T. Eck, FAA Assistant Administrator for NextGen, at (202) 267-7111 or email James.Eck@faa.gov.

Sincerely,

Victoria B. Wassmer
Acting Deputy Administrator

cc: James T. Eck, Assistant Administrator, NextGen
    Teri L. Bristol, Chief Operating Officer, Air Traffic Organization
    Winsome Lenfert, Acting Associate Administrator, Airports
    Jenny Solomon, Assistant Administrator for Policy, International Affairs, Environment and Energy
    John Hickey, Deputy Associate Administrator, Aviation Safety
Appendix B: NEC NextGen Integration Task Group

Air Line Pilots Association (ALPA)
Airlines for America
American Airlines, Inc.
Baltimore/Washington International Thurgood Marshall Airport (BWI)
Beacon Management Group
Delta Air Lines, Inc.
Federal Aviation Administration (FAA)
FedEx Express
General Aviation Manufacturers Association
Harris Corporation
HMMH (DP)
JetBlue Airways
Landrum-Brown
Leidos
Massachusetts Port Authority
Metron Aviation, Inc.
Metropolitan Washington Airports Authority
MIT Lincoln Laboratory
NASA
National Air Traffic Controllers Association (NATCA)
National Business Aviation Association
NOISE (The National Association to Insure a Sound Controlled Environment)
PASSUR Aerospace
Philadelphia Airport
Port Authority of New York & New Jersey
Professional Aviation Safety Specialists (PASS)
Raytheon
RTCA, Inc.
Sandel Avionics, Inc.
Southwest Airlines
The Boeing Company
The MITRE Corporation
United Airlines, Inc.
United Parcel Service (UPS)