Goals and Priorities for Improving Operations in the Northeast Corridor Phase One

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

June 2017
## Contents

- **Background/Introduction** .................................................................................................................. 3
- **Assumptions** ........................................................................................................................................ 3
- **Guiding Principles** ............................................................................................................................... 4
- **Methodology** ......................................................................................................................................... 5
- **Goals for the Northeast Corridor** ........................................................................................................ 6
  - **Tiers of Operational Benefit** ............................................................................................................... 6
  - **Near-Term Goal** ............................................................................................................................... 6
- **Metrics that Define Success** ................................................................................................................ 7
- **Controller Staffing and Resources** ..................................................................................................... 8
- **Capability Objectives to Improve NEC** .............................................................................................. 8
- **Prioritization of Capability Objectives** ............................................................................................ 10
- **Implementation Hurdles** .................................................................................................................... 11
- **Appendix A: NAC Approved Metrics** ................................................................................................. 12
- **Appendix B: NACSC Members/NEC Task Group** ................................................................................ 13
- **Appendix C: FAA Tasking Letter** ...................................................................................................... 14
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 (Washington, DC – Boston). 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 FAA formally tasked the NAC in April 2017\(^1\) (Appendix C) to develop recommendations for the collective set of FAA, airport, operator and community initiatives that focus on implementing NextGen in the Northeast Corridor.

This report responds to Phase 1 of the task request which states:

*Phase 1: 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.*

Given this request, the following report focuses on

1) Goals for Improving the Northeast Corridor
2) Metrics to Evaluate these Goals
3) Identification of Capability Objectives for the NEC
4) Prioritization of Capability Objectives through qualitative assessment of the impact of each capability on goals/metrics as well as the time required and risk for each option

Assumptions

The industry members from the NextGen Advisory Committee Subcommittee (NACSC) served as the Northeast Corridor (NEC) Task Group (TG) and identified the following Assumptions for the effort to impact the Northeast Corridor:

- The NEC includes the Washington, DC/Baltimore, Philadelphia, New York and Boston airports and associated airspace
- Time frames for NEC effort are <18 months, 18-36 months, 3+ years
- Adverse weather is a major issue in improving operations in the NEC

---

\(^1\) Tasking letter dated April 13, 2017 from Ms. Victoria Wassmer to Margaret Jenny, RTCA President.
• Factors for Success/Hurdles/Risk Factors
  o Assume financial support will materialize to move forward on prioritized initiatives
  o FAA Northeast corridor staffing key to success, daily operations and implementing new capabilities
    ▪ Unless sufficient staffing levels are achieved in the Controller work force, Traffic Management Units, Air Traffic Control System Command Center and supervisory workforce in facilities providing service in the Northeast corridor, the goals outlined in this document relative to implementation of technologies, procedures and processes will not be achievable.
  o Priorities for NEC may negatively impact timing of other initiatives
  o Equipage may determine desire to implement certain initiatives and ability to achieve benefits
  o Environmental issues/concerns are critical in reviewing capabilities

• Areas of Focus
  o Key driver of variation in operations is decision-making by different individuals (operator & air traffic), each with own experience and skill level
  o Scheduled operators are focused on schedule integrity and reduction of block times where opportunities exist
  o On demand operators focused on time minimization

• Willingness to be key site for new capabilities

Guiding Principles
The Task Group identified the following Guiding Principles for the effort to impact the Northeast Corridor:

• Capabilities should have an overall positive system effect on NEC
  o Improving overall system performance may have some limited local negative impacts; these should be minimized
  o Capability discussion requires understanding of trade-offs – develop strategies to avoid
• Effort should establish quantitative “stretch” goal(s)
• Block times and called and actual rates should be the focus through this effort
• No increase in equipage mandates
• NEC is unique; hence capabilities in the NE Corridor may be unique
• Considerations in Establishing Priorities
  o Priorities should enable full utilization of available capacity in NEC, especially during peak demand periods and/or during IROPs
Buy-in from local communities and governments should be possible
Effort should remain consistent with the overall NextGen’s TBO Vision and PBN NAS NAV Strategy
Process needs to recognize “burn-in” component to implementation; burn-in should be addressed and continually improved
Priorities should be consistent with critical resource availability (technical, controllers, tech pilots, etc.)
Important to evaluate the effects of improvements/enhancements at an airport/airspace area on those adjacent or in close proximity

Methodology
The development of the recommendation entailed several steps that provided the aviation community with opportunities to determine the goals for the recommended actions; metrics to evaluate the success of the actions; and the prioritization of the capability objectives to achieve the goals. This Phase One recommendation sets the stage for specific implementations that will be developed jointly between the FAA and the aviation community.

The following highlights the steps taken to develop this report.

February 22, 2017 Meeting of the NextGen Advisory Committee – initial discussion and subsequent request for feedback/input from NAC member organizations on the method to proceed, along with the goals and the metrics for NextGen capabilities that can improve operations in the Northeast Corridor.

March-June 2017 – The industry members of the NextGen Advisory Committee Subcommittee (NACSC) served as the Northeast Corridor (NEC) Task Group (TG) and received a series of briefings and engaged in discussions on current FAA and aviation industry initiatives in the NEC. The FAA provided experts that served as Subject Matter Experts (SMEs) for the Task Group.

As outlined in this report, the Task Group used a collaborative process to develop the following sections of the report:

• Goals-Metrics
• Assumptions and Guiding Principles
• Review of Capabilities
• Consideration and Review of Previous (2013) Prioritization Effort – Benefits, values and Outcomes (excluded implementation readiness for this phase)
• Ranking of High-level List of Capability Objectives Using a Quantitative Assessment and NAC established prioritization criteria – Vetted by Task Group
Goals for the Northeast Corridor

Tiers of Operational Benefit

There are three tiers of operational benefit for the Northeast Corridor:

**Tier 1: Improve execution of today’s operation in the NEC**

The first-tier focus is on improving today’s operation, namely improving predictability and reducing delay. Closing the gap between IFR and VFR rates may be a key aspect to maintaining schedule, reducing variability, improving predictability and completion factor. This includes reducing delay on the ground required to access the airspace. The first tier is focused on getting better at running the existing, full intended operation on time. For operators, the primary focus is on maintaining the revenue they already have and some cost reduction.

**Tier 2: Operate today’s flights more efficiently**

The second tier presumes success in the first tier. With a more reliable operation, the goal expands to include more efficient operations, namely improving upon the costs of time and fuel. This may include less vectoring, less tromboning, Optimal Profile Descents (OPDs) in the terminal area for arrivals, more optimal paths En route, etc. Step two is about minimizing the cost of operating the intended operation.

**Tier 3: Grow the capacity and schedule**

The third tier is focused on growth in the region. This step is about enhancing capacity, whether in the airspace or at the airport and links to growing revenue for operators.

Near-Term Goal

For the next 18 months, the goal for the Northeast corridor is to improve the traveler experience through better execution of today’s operation and adverse weather is a major issue in accomplishing this goal. This goal is applicable to any end traveler of the air traffic system, whether they be the traveling public, packages or business travelers. This goal is applicable to all weather conditions but the benefits accelerate when the weather deteriorates.

This goal can be further defined by three key sub-components:

- *Operate the full intended operation* – the traveling public’s first desire is that its flight is operated and not canceled
- *Operate on time* – assuming the flight is not cancelled, the traveler desires that his or her flight operate on time
- *Operate predictably* – finally, when there are extenuating circumstances, such as bad weather, the traveler desires to have predictability as to when and how their flight will operate, narrowing the uncertainty

The Tier 2 and Tier 3 goals identified above are applicable beyond 18 months. The longer term (beyond 18 months) may provide additional opportunities for aircraft equipage and ATC automation tools to deliver operational benefits.
Metrics that Define Success

Metrics that evaluate success against the goal of improving execution of today’s operation are presented below. These metrics were developed from the NextGen Advisory Committee’s set of approved metrics (See Appendix A). The metrics are defined relative to the three subcomponents of the goal:

<table>
<thead>
<tr>
<th>Near Term Goal</th>
<th>Associated Metrics</th>
<th>Definition / Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operate the full intended operation</td>
<td>Completion Factor</td>
<td>Percent flights that operate from origin to destination as intended/scheduled</td>
</tr>
<tr>
<td>Operate on time</td>
<td>Departure Delay versus schedule</td>
<td>Percent flights that depart/arrive to gate at or before scheduled time²</td>
</tr>
<tr>
<td></td>
<td>Arrival Delay versus schedule</td>
<td></td>
</tr>
<tr>
<td>Operate predictably</td>
<td>Departure/Arrival delay versus schedule</td>
<td>Total delay minutes</td>
</tr>
<tr>
<td></td>
<td>Actual Block Time</td>
<td>60th percentile and Standard Deviation</td>
</tr>
<tr>
<td></td>
<td>o Taxi Out</td>
<td>Actual times for city pair, arrival or departure airports</td>
</tr>
<tr>
<td></td>
<td>o En Route</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Taxi In</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Called and Actual Throughput</td>
<td>Mean/peak facility called rates and actual throughputs for airport/airspace</td>
</tr>
</tbody>
</table>

Not all metrics will be applicable to all types of operators. Additionally, the metrics above are impacted by numerous operator actions, such as scheduling practices, aircraft types and equipage rates and frequencies. While performance of these measures is impacted by factors unrelated to NextGen implementations, NextGen implementations are expected to positively impact this set of metrics.

To effectively evaluate success of the stated goal through these metrics, a baseline of performance today is required. The Joint Analysis Team, which will ultimately evaluate the success of any implementations in the Northeast Corridor, is the appropriate entity to refine the approach to metrics and measure the baseline. Once a baseline is established, quantitative stretch goals should be defined for these metrics in the NEC.

² For non-scheduled FAR Part 91 and 135 operators, a “Call Ready to Push” is utilized as a proxy for scheduled departure time.
Controller Staffing and Resources

The assurance of sufficient staffing levels in the Controller workforce, Traffic Management Units, Air Traffic Control System Command Center and supervisory workforce in facilities providing service in the Northeast corridor is a fundamental assumption in evaluating the prospects for successful achievement of the goals outlined in this document. It is important to understand the limitations imposed by understaffed facilities and how that condition factors into the prospects for success and timelines for any proposed initiatives. From a tactical standpoint, lack of staffing manifests itself in traffic flow management restrictions that negatively affect efficiency and capacity goals. From a strategic perspective, certain major facilities are critically understaffed. The number one priority is conducting on-the-job training for developmental employees. The time and resources for participating in design and development activities and training for new technologies, tools and procedures is limited. Achievement of sufficient staffing levels is an underlying thread that is pulled through each proposal in this response.

Capability Objectives to Improve NEC

The following are capability objectives for implementation and focus in the Northeast Corridor. The sample Related Projects are designed to assist in understanding, but are not a comprehensive list. That list will be examined during Phase 2.
<table>
<thead>
<tr>
<th>Capability Objectives</th>
<th>Description</th>
<th>Sample Related Projects &amp; Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deconflict Airports</td>
<td>• Reduce or remove dependencies between New York airports that constrains airport throughput today</td>
<td>Specific ideas include: • Increase use of enhanced PBN procedures and/or GLS • Deconflict LGA ILS-13 from EWR &amp; TEB • EWR 04R missed app right turn to deconflict TEB dep’s • LGA, JFK operations – LGA 31 PBN</td>
</tr>
<tr>
<td>Improve Individual Airport Throughput</td>
<td>• Improve throughput to/from NEC airports and terminal airspace sectors  • May impact separation standards, rules, etc.</td>
<td>Specific ideas include: • Term Airspace Resectionization • 3 LGA RNAV Departures/ELSO • 7110.308: BOS, EWR, PHL • Capping and tunneling • Use of IDAC &amp; IDRP • MIT passbacks • CRDA at JFK, LGA • ReCat at BOS/IAD • EoR • GLS • EFVS</td>
</tr>
<tr>
<td>Improve and Integrate Existing Flow Management Capabilities</td>
<td>• Improve use and adaptation of existing tools  • Enhance collaborative planning process and tools  • Integrate application of existing capabilities across system</td>
<td>• TFMS  • Use of TBFM/RAPT/IDRP  • Departure Pre-Scheduling  • Utilize CTOP  • Improve EWR/PHL metering  • Surface data sharing  • DSP/PDRR</td>
</tr>
<tr>
<td>Improve Airspace Throughput</td>
<td>• Improve throughput through NEC airspace and en route airspace sectors  • May impact separation standards, rules, etc.</td>
<td>• ER Airspace Resectionization  • ZNY Offshore Resectionization and PBN SID s &amp; STARS  • Atlantic Coast Route Program (ACRP)</td>
</tr>
<tr>
<td>Implement New Flow Management Decision Support Tools</td>
<td>• Implement new tools to assist in future time-based flow management</td>
<td>• Surface/TFDM  • Implement TSAS  • FMS RTA/Airborne metering  • Expand use of IDAC  • ER DataComm/ABRR  • Consider Time-based Separation</td>
</tr>
<tr>
<td>Improve NAS Information, Common SA</td>
<td>• Enhanced information to aid in planning or decision making</td>
<td>• On Demand NAS info  • National Operational Dashboard  • New modeling/analysis capabilities</td>
</tr>
<tr>
<td>Create New Noise Abatement Procedures</td>
<td>• Implement and operate new noise abatement procedures that maximize aircraft participation and, where feasible, reduce impact to local communities</td>
<td>Procedure ideas: • ROBER OPD to JFK  • Nighttime GLDMN  • Off-peak noise efficient nighttime alt  • DCA South SIDs  • PBN O/W app to LGA 22  • Offset app to EWR 22L</td>
</tr>
</tbody>
</table>
Prioritization of Capability Objectives

The capability objectives above were prioritized through a survey of members of the Task Group. The survey asked members of the Task Group to identify which objectives are most important to achieving the goal of improving execution of today’s operation in the NEC. Respondents were asked a series of questions in which they had to rank order these seven options. Except for Implementation Readiness, the survey was structured to utilize the criteria and their relative weightings defined in the September 2013 NAC report “NextGen Prioritization” to assess the results.

Results from the survey are presented below. The Average Rank metric ranges from 1 to 7 with 7 representing the highest possible rank. The Percent in Top 3 metric presents the percent of all responses in which the capability objective was ranked as one of the top 3 capabilities out of the 7 options.

<table>
<thead>
<tr>
<th>Capability Objectives in Priority Order</th>
<th>Average Rank</th>
<th>Percent of Responses with Capability Ranked in Top 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deconflict Airports</td>
<td>5.2</td>
<td>73%</td>
</tr>
<tr>
<td>2. Improve Individual Airport Throughput</td>
<td>4.8</td>
<td>58%</td>
</tr>
<tr>
<td>3. Improve and Integrate Existing Flow Management Capabilities</td>
<td>4.5</td>
<td>42%</td>
</tr>
<tr>
<td>4. Improve Airspace Throughput</td>
<td>4.1</td>
<td>47%</td>
</tr>
<tr>
<td>5. Implement New Flow Management Decision Support Tools</td>
<td>3.9</td>
<td>38%</td>
</tr>
<tr>
<td>6. Improve NAS Information, Common Situational Awareness</td>
<td>3.5</td>
<td>27%</td>
</tr>
<tr>
<td>7. Create New Noise Abatement Procedures</td>
<td>2.0</td>
<td>15%</td>
</tr>
</tbody>
</table>

The survey results indicated that the Task Group recommends that two capabilities – **Deconflict Airports** and **Improve Individual Airport Throughput** – should be given higher priority. As the Phase 2 NIWG group confronts decisions around project-level prioritization, these survey results should guide decision-making. These priorities are consistent with recommendations identified in Task Force 5.

These areas of focus should not disrupt activities that are already undergoing implementation and close to completion. If there is ‘low hanging fruit’ of low effort, low risk projects that fall outside of these two focal areas, they should still be given due consideration in Phase 2. Likewise, during Phase 2 of this task, as specific projects are considered, implementation readiness will be an important factor in project-level prioritization.
Implementation Hurdles

As requested by the FAA Tasking letter, the Task Group identified the following hurdles that may result in implementation challenges (these are similar to those identified by Task Force 5 and the NAC 2013 Prioritization):

- Overarching: Controller staffing and resources (detailed above)
- Collaborative engagement between all ATC operational lines of business and operators in the airspace
- Collective ability or willingness to (de)prioritize specific projects or initiatives
- Collective ability to adjust existing plans and schedules
- Cultural issues – i.e. controller, pilots, dispatcher acceptance and implementation
- Environmental issues and concerns
- Funding
- Mixed equipage of aircraft/differing capabilities
- Operator staffing and resources
- Penetration of PBN equipage or ability to leverage available equipage
- Pre-operational planning and agile flexibility in consideration of unforeseen constraints that require real time adjustments to the plan
- Training
## NAC Approved Metrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Reported Values</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 1. Actual block time             | Mean and std dev or 60% percentile | - Actual time from Gate-Out time to Gate-In time for a specified period of time by city pair  
- GA: IFR flight time from ramp taxi to ramp park  
- GA: IFR flight distance from take-off to TOC & from TOD to touch down  
- Actual fuel burn for a specified period of time |
| 2. Actual distance flown         | Mean and std dev or 60% percentile |                                                                                                                                                                                                         |
| 3. Estimated Fuel burn           | Mean and std dev                  |                                                                                                                                                                                                         |
| 4. Throughput - facility reported capacity rates * | Mean and peak capacity rates | Facility Airport Arrival Rates (AAR) & Arrival Departure Rate (ADR) Airlines (recommend: [http://www.fly.faa.gov/](http://www.fly.faa.gov/) however, the working group is open to alternate measurements that meet the requirements)  
- GA; measured as access events - Radar vector and not SID as OUT event and Ground based nav and not GPS / WAAS-LPV as IN event  
- Actual time from Gate-Out to Wheels-Off time by airport (minutes/flight)  
- GA: IFR flight taxi time from ramp taxi to take off |
| 5. Taxi-out Time *               | Mean and std dev or 60% percentile | Actual time from Gate-Out to Wheels-Off time by airport (minutes/flight)  
- GA: IFR flight taxi time from ramp taxi to take off |
| 6. Gate Departure Delay          | Delays/100 act depts. And total delay minutes | Difference in actual Gate-Out time and scheduled Gate-Out time, Not measured for GA                                                                                                                     |

* - Identified by FAA  
1 GA data may not currently be collected  

Note: In course of detailed Joint Analysis Team evaluation of implementation, additional metrics may also be necessary for inclusion in the analysis.
Appendix B: NACSC Members/NEC Task Group

| Aerospace Industries Association (AIA) | LeighFisher |
| Air Line Pilots Association (ALPA) | Metron Aviation, Inc. |
| Airbus | Mosaic ATM, Inc. |
| Aircraft Owners and Pilots Association | National Air Traffic Controllers Association (NATCA) |
| Aireon, LLC | National Association of State Aviation Officials |
| Airline Dispatchers Federation | National Business Aviation Association |
| Airlines for America | NAV CANADA |
| Airports Council International (ACI North America) | NOISE (The National Association to Insure a Sound Controlled Environment) |
| Alaska Airlines | Northrop Grumman Corporation |
| American Airlines, Inc. | Port Authority of New York & New Jersey |
| Atlas Air | Professional Aviation Safety Specialists |
| Cessna Aircraft Company | Project Management Enterprises Inc. |
| City of Houston, Texas | Raytheon |
| Dallas/Fort Worth International Airport | Regional Airline Association |
| Delta Air Lines, Inc. | Rockwell Collins, Inc. |
| DoD Policy Board on Federal Aviation | RTCA, Inc. |
| Elbit Systems | Saab Sensis Corporation |
| EUROCONTROL | Sandel Avionics, Inc. |
| FedEx Express | Sensurion Aerospace |
| Garmin Ltd. | SESAR Joint Undertaking |
| General Aviation Manufacturers Association | Southwest Airlines |
| Harris Corporation | Thales Group |
| Honeywell International, Inc. | The Boeing Company |
| International Air Transport Association | The MITRE Corporation |
| Jeppesen | U.S. Air Force |
| JetBlue Airways | United Airlines, Inc. |
| Jetcraft Avionics LLC | United Parcel Service (UPS) |
| L-3 Communications | |
| Leidos | |
Appendix C: 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