Federal Aviation Administration

NextGEN

NEXTGEN ADVISORY COMMITTEE NEXTGEN PRIORITIES JOINT IMPLEMENTATION PLAN CY2019–2022: 2021 UPDATE

This *NextGen Priorities Joint Implementation Plan CY2019–2022: 2021 Update* is prepared and signed by:

June 21, 2021

Teri L. Bristol, Chief Operating Officer, Air Traffic Organization Date

CHRISTOPHER J ROCHELEAU

Digitally signed by CHRISTOPHER J ROCHELEAU
Date: 2021.05.28 09:54:10 -04'00'

Chris Rocheleau, Deputy Associate Administrator for Aviation Safety Date

DocuSigned by:
654E6A9CF3B8417...

6/21/2021

Pamela Whitley, Assistant Administrator for NextGen Date

EXECUTIVE SUMMARY

The Federal Aviation Administration (FAA) and the aviation stakeholder community have been collaborating on the successful implementation of NextGen in the National Airspace System (NAS) for more than a decade.

In 2009, through RTCA Task Force 5 and the subsequent creation of the NextGen Advisory Committee (NAC) in 2010, the FAA collaborated with stakeholders to develop a broad outline of the NextGen vision and lay out initial operational concepts. By 2013, with encouragement from The House Committee on Transportation and Infrastructure, FAA collaboration efforts with the NAC had matured to focus on joint NextGen implementation commitments. This led to the creation of the NextGen Joint Implementation Plan (NJIP) and the development of the NAC's NextGen focus areas of:

- Data Communications (Data Comm)
- Surface and Data Sharing
- Multiple Runway Operations (MRO)
- Performance Based Navigation (PBN)
- and eventually a NAC-requested focus on the Northeast Corridor (NEC)

This *NextGen Priorities Joint Implementation Plan CY2019−2022: 2021 Update* (*2021 Update*) is the result of an annual assessment of the milestones included in the original *NextGen Priorities Joint Implementation Plan CY2019−2021* (NJIP) published on June 25, 2019. This *2021 Update* covers the timeframe since the last update was published on August 5, 2020.

Since publishing the 2020 update, FAA and NAC stakeholders continued experiencing program delays to the NextGen joint implementation commitments as a direct result of ongoing barriers caused by the COVID-19 pandemic.

As a result of pandemic disruptions and the inability to forecast completion of program milestones, the FAA announced a one-year extension of the NJIP to 2022 at the November 2020 NAC Meeting. This extension allows for rescheduling of milestones that have the potential of delaying well into 2022 and beyond. By extending the NJIP, the FAA remains committed to the successful implementation of all the original milestones that were jointly agreed to with NAC stakeholders as their priority areas for NextGen.

While there is reason for optimism as national vaccination rates steadily climb and infection rates steadily fall, the FAA is already positioning itself to rapidly reinstate activities necessary to re-deploy these systems. There are also hopeful signs as travel and economic recovery in the aviation sector progresses following unprecedented levels of disruption and volatility related to the pandemic.

This *NJIP 2021 Update* documents the changes that have been reported, discussed and agreed upon within each of the NAC focus areas technical working groups as of April 30, 2021. Additionally, it documents successes and completed milestones within each focus area.

SUCCESSES

Since March 2020, the COVID-19 pandemic significantly impacted government and aviation stakeholder operations, resulting in unprecedented business disruptions and volatility.

The FAA took action in line with CDC guidance and advice from the FAA Federal Flight Surgeon to protect the critical controller workforce. These protections resulted in the suspension of face-to-face engagements at FAA field facilities that were not directly tied to safely operating the Nation's airspace system during the pandemic.

Despite these barriers, the FAA and NAC persevered to continue making progress where able throughout 2020 and early 2021 on NJIP commitments. Since the last update, FAA program managers have looked for creative ways to move NAS modernization forward by:

- Employing virtual remote capabilities for everything from system testing to conducting safety panels and site surveys.
- Staging program related materials at field facilities to prepare for the resumption of on-site activities.
- Continuously refining the timing for the controller workforce training, certification, and user acceptance, which are the lynchpins for implementation. For example, a large program such as Data Comm requires an entire en route center and hundreds of controllers to first be trained and then thereafter remain 'current' on the system.
- Starting to schedule some test and training activities at the FAA Technical Center for Terminal Flight Data Manager (TFDM) and Data Comm, with programs to follow as appropriate.
- Continuing work on safety critical activities such as En Route Automation Modernization (ERAM) technology refreshes and system modifications (critical security upgrades, fixes).

As you can see from these examples, NextGen implementation work, which has always required a complex choreography of engineering and program management to accomplish, has become exponentially more complex with COVID-19 pandemic barriers.

It is the FAA's commitment to all NextGen stakeholders that we will continue to lean in as far as we can, mindful of the safety of our workforce

Although many milestones remain in a TBD status, there is reason for cautious optimism in the coming year. The following sections of this report highlight specific successes in each of the NAC focus areas.

Multiple Runway Operations

Beginning in early 2019, the FAA implemented the Consolidated Wake Turbulence (CWT) standard at fourteen TRACONS (Terminal Radar Approach Control Facilities). These eight

TRACONS equate to the successful implementation of 129 towers associated with the TRACONS' airspace.

Implementation of CWT is planned to continue during the 2021 to 2022 timeframe. In addition, an FAA-led initiative to increase the quantity and quality of wake turbulence reporting, resulted in:

- Outreach to the General Aviation community
- Update to the Airman Information Manual
- Briefings to principal operations inspectors of major carriers.

Wake turbulence reports through the Aviation Safety Reporting System are received on a regular basis. Recent changes to the FAA Comprehensive Electronic Data Analysis and Reporting (CEDAR) system will incorporate wake turbulence events as a specific item for mandatory occurrence reports. These efforts have increased awareness of the importance of accurately reporting all wake events within both the pilot and controller communities.

The FAA anticipates an increase in the quality and quantity of reports through feedback from the user community, and a slight increase in the quantity of reports has been noted.

Furthermore, the FAA completed eight pre-implementation milestones consisting of analyses and development of new operational concepts associated with the simultaneous parallel runway operations and aircraft wake turbulence separation improvements.

Performance Based Navigation

The FAA closed-out the Denver Metroplex project on October 30, 2020. The planned delivery of the six-month post-implementation analysis was delayed due to suppressed traffic levels resulting from the COVID-19 public health emergency. Post-implementation data collection started in July 2020. Delivery of the analysis is expected in June 2021. Here are some highlights from a quick-look of initial data:

- Standard Terminal Arrival Route (STAR) balancing
    - 75% of arrivals use their preferred STAR
- Runway clearance changes
    - 79% of arrivals land on the runway matching the runway transition assigned by Denver Air Route Traffic Control Center (ZDV-Denver Center)
- Conformance
    - There are small improvements seen in operators conforming to STAR procedure standards

- Level flight
    - There are small decreases seen in level flight, indicating more use of smoother optimize profile descents

The FAA successfully implemented the Las Vegas Metroplex project on February 26, 2021. The project implemented 45 new and revised standard instrument departures (SIDs), standard terminal arrival routes (STARs), and standard instrument approach procedures (SIAPs) for Las Vegas McCarran International Airport, Henderson Executive Airport and North Las Vegas Airport. The total includes:

- Five low-altitude GPS based T-routes and three high-altitude RNAV based Q-routes (en route airway routes)
- Thirty-six air traffic control sector boundaries were changed at Los Angeles Air Route Traffic Control Center (ZLA) and Las Vegas Terminal Radar Approach Control (L30)
- The first use of a track-to-fix (TF), to approximate a radius-to-fix transition on an ILS procedure to mirror the RNP approach procedure.

Las Vegas post-implementation phase data gathering started in March 2021 with the post-implementation analysis report expected in September 2021.

The FAA issued the South/Central Florida Metroplex project Final Environmental Assessment and Record of Decision on October 15, 2020, starting the Implementation Phase.

- On April 22, 2021, the first of two implementation phases was completed.
    - The project published 54 new and revised SIDs, STARs and SIAPS, and 11 new low-altitude GPS based T-routes.
    - Thirty-seven of the procedures were implemented, while 17 procedures are NOTAM'd N/A.
    - The 17 procedures will be implemented along with 77 additional procedures in the second phase of implementation on August 12, 2021.

Surface and Data Sharing

The COVID-19 pandemic produced significant challenges to achieving the Surface and Data Sharing milestone commitments. Due to the pandemic, travel to FAA facilities has continued to be restricted which prevented hardware implementation, operational testing, and training from being conducted. Despite these challenges, the FAA and industry made significant progress.

The FAA developed a new remote access capability allowing for the continued developmental testing of the Terminal Flight Data Manager (TFDM) Build 1 software. This new remote testing capability enabled the TFDM program to make progress toward the goal of operational testing of the system. In parallel, the TFDM program continued the development of the TFDM Build 2 software. An initial version of this software was delivered to the FAA in January 2021. This

software development continues the progress toward TFDM commitments to deliver TFDM Build 2 to Charlotte, NC.

Based on industry feedback in 2020, the FAA also developed a new TFDM testbed that can be accessed remotely by industry partners. The testbed is a full version of TFDM software operating in a laboratory environment. This new capability enables industry to start developing tools that can utilize the new surface data produced by TFDM. This capability will assist industry in preparing for TFDM's deployment and developing tools to maximize the benefits of new surface data and operations. In 2021, the FAA has two industry partners who have already applied to connect to the testbed.

The Air Space Technology Demonstration 2 (ATD-2) National Aeronautics and Space Administration (NASA) team, in collaboration with the FAA and industry, continued preparing for its final Phase 3 field evaluation at the North Texas Region. The ATD-2 team was no longer able to physically visit the field facilities and had therefore transitioned to remote training and tabletop exercises, and produced numerous videos designed specifically for each field user via virtual platforms. Additionally, and to provide a greater volume of Trajectory Option Set (TOS) evaluation opportunities in the event that decreased traffic persists, the ATD-2 team deployed the system to a new airline operator, defined additional use cases for the flight operators to increase the TOS requests, and developed a new capability for alternative ATC users to increase TOS approvals. NASA is on schedule for the delivery of the final technology transfer from Phase 3 to the FAA and industry by September 2021.

The FAA and industry continued their commitment to collaboration during the pandemic. Both FAA and industry participated in three SWIM (System Wide Information Management) Industry-FAA Team (SWIFT) meetings to develop new techniques and technology for sharing and using aviation data. Furthermore, the FAA conducted multiple site outreach activities with airports and airlines to help them better understand the TFDM system.

Data Communications

The Data Communications (Data Comm) program provides a digital air-to-ground link and the integration of aircraft avionics and ground ATC automation systems to deliver electronic messaging capabilities between air traffic controllers and flight crews in both the tower and en route domain.

A supplement to Frequency Protected Air-Ground voice communications, Data Comm enables controllers to text flight clearance and reroute instructions to multiple aircraft at once. Without Data Comm, a controller reads the route of flight to the pilot over a voice radio. Then the pilot is required to read those instructions back to the controller to confirm the pilot fully comprehends those directions, and then the pilot manually enters the clearance. The longer the flight, the more complicated the readback, which increases the possibility of mistakes during the readback.

With Data Comm, air traffic can issue an entire route of flight with a single data transmission. Data Comm reduces the communication time between controllers and pilots, which reduces gate delays and taxi-out times, thereby improving the overall efficiency of the system. When plans

change, pilots can accept route revisions as many times as necessary during flight and on the ground.

Data Comm delivers the following benefits:

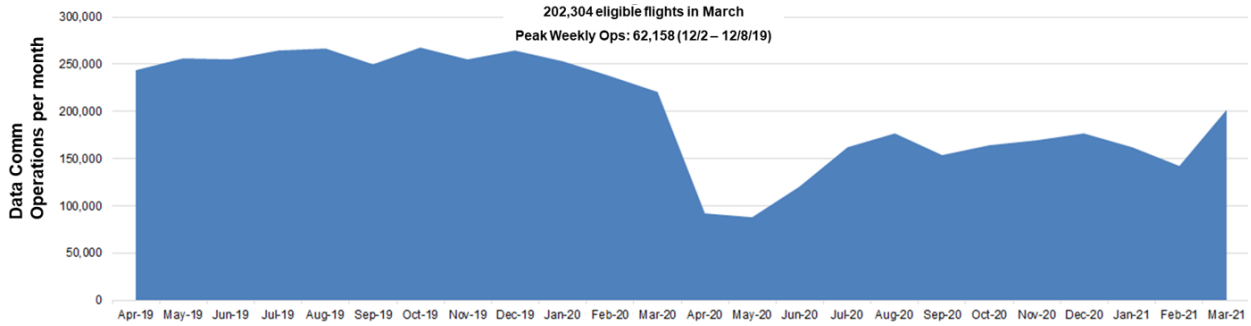
- Reduced impacts from ground delay programs, airport reconfigurations, convective weather, congestion, and other causes;
- Reduced communication errors;
- Improved controller and pilot efficiency through automated information exchange;
- Increased controller productivity leading to increased capacity.

The operations and services enabled by Data Comm enable more efficient and strategic management of the airspace, enabling the Agency to meet the growing demand for air travel, all while improving operational and life-cycle costs for both airspace managers and users.

Success in the Data Communications arena continues to produce benefits and is evidenced in operations. Data Comm Tower Services Departure Clearance (DCL) operations have grown steadily since the completion of the baseline deployment in December 2016. Operations have increased from approximately 17,000 operations per week, as measured in December 2016, to over 62,000 operations per week, as measured late in 2019 and early 2020. COVID-19 impacted Data Comm tower operations; however, the weekly metrics continue to recover approaching 50,000 operations per week through March 2021

Moreover, the number of operators participating has more than doubled, from 33 domestic and international operators in December 2016, to 84 domestic and international operators as of March 2021.

Data Comm Tower Operations January 2016 through March 2021



The benefits through March 2021 for Tower Data Comm include:

- 2.51 million minutes of comm time saved
- More than 1.77 million minutes of airspace user time saved
- More than 1.27 billion passengers served
- More than 9.69 million flights cleared

- 20.51 million Kgs of CO_2 emissions prevented
- More than 135,000 readback errors avoided

Data Comm Tower, capitalizing on success in the operational roll-out, completed the original 55 airports 29 months ahead of schedule and under budget. The budget savings enabled the FAA to deploy Data Comm at seven more airports than originally planned and at no additional cost. Again, leveraging the success of the initial roll-out, the program deployed the additional seven towers a full 13 months ahead of the original schedule for the 55 towers.

Data Comm is operational at the original 55 air traffic control towers, plus the seven additional, for a total of 62, as shown in the list below.

Data Communications: 62 Tower Service Airports

- Albuquerque
- Atlanta
- Austin
- Baltimore-Washington
- Boston
- Buffalo
- Burbank
- Charleston
- Charlotte
- Chicago-O'Hare
- Chicago Midway
- Cleveland
- Columbus
- Dallas-Ft. Worth
- Dallas-Love
- Denver
- Detroit
- Fort Lauderdale
- Fort Myers
- Houston Bush
- Houston Hobby
- Indianapolis
- Kansas City
- Las Vegas
- Los Angeles
- Louisville
- Memphis
- Miami
- Milwaukee
- Minneapolis-St. Paul
- Nashville
- New Orleans
- New York John F. Kennedy
- New York LaGuardia
- Newark
- Oakland
- Ontario
- Orlando
- Philadelphia
- Phoenix
- Pittsburgh
- Portland
- Raleigh-Durham
- Reno-Tahoe
- Sacramento
- Salt Lake City
- San Antonio
- San Diego
- San Francisco
- San Jose
- San Juan
- Santa Ana
- Seattle
- St. Louis
- Tampa
- Teterboro
- Van Nuys
- Washington-Andrews
- Washington Dulles
- Washington Reagan
- Westchester County
- Windsor Locks (Bradley)

In December 2020, the Program Office received approval to activate Data Comm Tower Services at 3 additional airports (Cincinnati, Jacksonville, and Palm Beach). Despite the impacts from the Government Shutdown and challenges associated with latent avionics and air-to-ground interoperability issues, the Program was able to achieve full operational capability at the first two Air Route Traffic Control Centers (ARTCC); Kansas City and Indianapolis in November 2019. A third ARTCC, Washington, was able to achieve 24x7 operations in March of 2020. COVID-19 halted deployment to the remaining 17 ARTCCs with a restart planned for late 2021.

From March of 2019 through March of 2021, the Data Comm Program supported the delivery of over 5 million message transactions to 22 different aircraft types and 17 operators.

The benefits through March 2021 for En Route Data Comm include:

- 100,171 readback errors avoided
- 378,195 minutes of comm time saved

As the FAA restarts the deployment schedule for the remaining ARTCCs post COVID-19, significant additional benefits in the En Route domain for both the FAA and Operators are expected.

The NextGen Advisory Committee (NAC) Joint Analysis Team (JAT) also undertook a benefits analysis specific to Data Comm Tower Services. Results from the JAT's performance analysis in October 2017 confirmed that, "Use of Data Comm for delivering route revision clearances results in reduced workload for pilots and controllers."

The JAT report also concluded: "Analysis demonstrates that flights using Data Comm for route revision clearance exhibit shorter taxi-out times compared to those that use voice."

Southwest Airlines conducted an independent analysis of Data Comm benefits to their operation in 2017 and found flights receiving revised routing via Data Comm yielded a 52-second benefit over non-Data Comm flights.

Southwest Airlines' analysis further concluded that Data Comm enables, "more efficient utilization of NAS capacity" and "allows system stakeholders to harness capacity that may otherwise be left to spoil." Notably, the Southwest Airlines analysis stated, "Data Comm enhances safety and reduces Pilot and Controller workload by reducing human machine interface errors, reducing frequency congestion and errors inherent with voice communications."

Northeast Corridor

The NextGen Advisory Committee, comprised of all major air carriers and representatives from across the aviation community, collaborated with the FAA in establishing the Northeast Corridor (NEC) as a NextGen priority with a focus on improvements to the busiest and most congested airspace in the NAS with an emphasis on the New York City airports and airspace.

Examples of success in the Northeast Corridor are highlighted below.

The FAA has achieved success implementing New York Air Route Traffic Control Center (ZNY) offshore PBN (Performance Based Navigation) routes.

Airspace congestion in offshore airspace east of the New York Metro area causes departure delays at EWR (Newark Liberty International Airport) and JFK (John F. Kennedy International Airport) during peak traffic periods. The congestion is mostly due to limited usable airspace when surrounding special use airspace is active. To address these constraints, New York Center realigned airspace sectors and in October 2019 implemented 16 new PBN Y (offshore) routes to segregate EWR and JFK departure and arrival flows.

The positive results of these changes include:

- Increased offshore airspace capacity, known as throughput
- Enabled greater use of offshore route options during severe weather events
- Less vectoring and holding of traffic in offshore airspace

At PHL (Philadelphia International Airport), Simultaneous Converging Instrument Approaches (SCIA) allow aircraft to land on PHL's converging runways (9R/17) in low visibility. Success is evidenced by the increase in arrival rate from 32 aircraft operations per hour (9R) to 48 aircraft operations per hour (9R/17). Moreover, an estimated 36 cancellations and approximately 18,000 minutes of delay were avoided, based on data for 2019 extrapolated from the NAC's Joint Analysis Team.

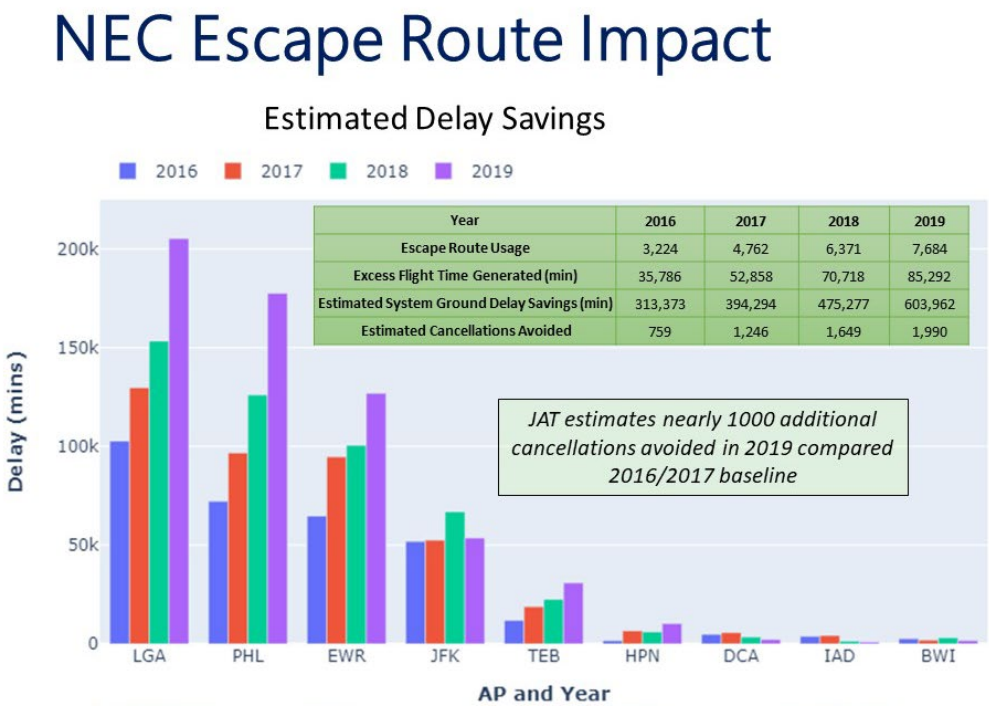
To pace improvements, the NEC was organized into phases. Successful results from Phase 1 included:

- Implemented En Route Departure Capability (EDC) at ZNY. This Time Based Flow Management (TBFM) functional component assigns runway departure times to flights departing to an en route constraint point.
- The Integrated Departure/Arrival Capability (IDAC) allows the four busiest New York City area towers (EWR, JFK, LGA (LaGuardia International Airport), and TEB (Teterboro Airport)) to interact electronically with departure timeline, compared to previous manual phone calls from the tower to ZNY. It also facilitates the use of EDC.
- Both EDC and IDAC are important building blocks for initial Trajectory Based Operations (iTBO) in the NEC. New York airport departures to ATL (Southeast Region, Atlanta Metroplex) are already experiencing reduced delay with the implementation of EDC and IDAC.

Consistent with previous JAT analyses, implementations of SCIA at PHL and EDC/IDAC continue to provide benefits to airlines.

NEC Phase II emphasized using FAA "capping and tunneling[1]," or escape routes, to increase throughput and reduce departure delays out of key NEC airports. Capping and tunneling procedures allow air traffic flows to be optimized by increasing use of available altitudes, results include removing traffic volume from higher tiered airspace and reducing delays by allowing sectors with more capacity to control this traffic. This traffic management initiative has proven to be effective in mitigating constraints throughout the NAS. The JAT has reported that capping and tunneling shows continual increases in escape routes since 2016, resulting in avoiding more than 200,000 minutes of delay and 1000 cancellations, as illustrated in the table below.

[1] Capping and tunneling processes use altitude restrictions to manage traffic volume and delays. Capping refers to aircraft being cleared to an altitude lower than requested to their arrival airport or until they are clear of a particular airspace. Tunneling aircraft refers to traffic being descended before the normal descent point at the arrival airport.



Referenced earlier in the Data Communications Success section, the Data Comm program pursued an aggressive schedule for implementing Data Comm Tower Services. In 2015, the program identified the importance of operational efficiency enhancements in the Northeast Corridor and worked with industry to prioritize the New York metro area airports on the deployment schedule for Data Comm Tower Services. The following New York metro area airports were successfully moved to the front of the schedule and did not incur additional cost or changes to the baseline schedule: EWR, JFK, LGA, TEB, HPN (Westchester County Airport) and PHL.

CHANGES

The changes, documented below, include an explanation for each NJIP milestone change which helps provide a common understanding, and also acts as a historical record over time.

Focus Area	Commitment	Original Date	2020 Update	New Date	Explanation
Multiple Runway Operations	FAA Implementation: CWT separation standards at 7 sites	Q4 CY2020	TBD	Q1 CY2021	The implementation of CWT has been delayed due to COVID-19. This implementation traditionally requires workforce training and having facility access. Through virtual meetings and trainings, the FAA will be able to continue with the CWT

Focus Area	Commitment	Original Date	2020 Update	New Date	Explanation
					implementation without traveling to the facilities.
Multiple Runway Operations	FAA Implementation: CWT separation standards at 5 sites	Q3 CY2021	TBD	Q2 CY2022	The implementation of CWT has been delayed due to COVID-19. This implementation traditionally requires workforce training and having facility access. Through virtual meetings and trainings, the FAA will be able to continue with the CWT implementation without traveling to the facilities.
Performance Based Navigation	FAA Implementation: Implement Metroplex at LAS (Las Vegas Metroplex): Post-implementation phase complete	Q2 CY2021	TBD	Q4 CY2021	This milestone is dependent upon the two phases preceding it – both of which are affected by COVID-19.
Performance Based Navigation	Industry: Provide input, validate data, review findings and confirm conclusions to post-implementation analyses for implemented PBN procedures – LAS	Q4 CY2021	TBD	Q2 CY2022	This milestone is dependent on the completion of the LAS Metroplex implementation and post-implementation analysis. These milestones have been affected by COVID-19.
Surface and Data Sharing	Joint NAC / FAA: FAA and industry will review current and subsequent changes of the TFDM waterfall to insure industry alignment no later than Q1CY2022 and continue through Q4CY2022	N/A	N/A	Q1 CY2022 & Q4 CY2022	This new milestone will allow FAA and industry to coordinate the TFDM waterfall to ensure industry understands the new post-COVID TFDM waterfall and can align industry plans to the waterfall.

Focus Area	Commitment	Original Date	2020 Update	New Date	Explanation
Surface and Data Sharing	Industry: Participate and provide input during recurring SWIFT meetings	Q2 CY2020, Q4 CY2020, Q2 CY2021, Q4 CY2021	TBD	Q2 CY2020, Q4 CY2020, Q2 CY2021, Q4 CY2021, Q2 CY2022, Q4 CY2022	Industry was able to resume participation in SWIFT meetings virtually.
Data Comm	FAA Pre-implementation: Baseline enhanced Data Comm services for En Route utilizing existing FANS (Future Air Navigation System) 1/A message set	Q3 CY2021	Q3 CY2022	Q3 CY2024	During the Data Comm NIWG (NextGen Integration Working Group) meeting on January 23, 2020, it was agreed to with industry to modify the milestone date, from CY2021 to CY2024, for baselining additional Data Comm services for En Route (Enhanced Services) utilizing the existing FANS 1/A message set. Extending the milestone by three years allows for additional time in the field for the operational use of En Route Initial and Full Services, which will reduce the implementation risk for follow-on capabilities, such as En Route Enhanced Services. The FAA will utilize the additional time to formulate an acquisition strategy and identify funding to execute a new Data Comm baseline. There may be additional delays to this milestone as a result of COVID-19 impacts to the Initial and Full Services deployment schedules, as well as resultant potential impacts to the FAA budget and funding for future enhanced Data Comm services.

Focus Area	Commitment	Original Date	2020 Update	New Date	Explanation
Data Comm	Industry Pre-Implementation: Baseline enhanced Data Comm services for En Route utilizing existing FANS 1/A message set	Q3 CY2021	Q3 CY2022	Q3 CY2024	There may be additional delays to this milestone as a result of COVID-19 impacts to the Initial and Full Services deployment schedules.
Data Comm	FAA Implementation: IOC for Initial En Route Services at all 20 CONUS (Continental United States) Air Route Traffic Control Centers (ARTCC)	Q4 CY2021	Q4 CY2022	N/A	Update: Despite the impacts from the Government shutdown as well as latent avionics and air-to-ground interoperability issues, the program was able to achieve full operational capabilities at the first two ARTCCs (ZID and ZKC) in November 2019, as well as 24x7 operations at a third ARTCC (ZDC) in March 2020. COVID-19 halted all activities at site 4 and beyond, and the remainder of the deployment schedule will need to be re-planned. The re-plan will likely push the last site IOC date into Q4 CY2022 and may move farther to the right depending on when the program can restart the deployment.
Northeast Corridor	FAA Implementation: Improved departure management for flights destined to LGA	Q2 CY2020	Q4 CY2020	TBD	This milestone is changing due to COVID-19. The FAA needs to enter the facilities and conduct safe education and Change Management activities for the completion of this initiative.
Northeast Corridor	FAA Implementation: Implement Departure Spacing Program (DSP) enhancements	Q4 CY2020	TBD	Q4 CY2021	The initial set of DSP enhancements was deployed in Q2 CY2019, and the remainder are delayed due to COVID-19. The TFMS program is unable to meet the planned date as this commitment is dependent on completion of an Operational Test and Evaluation at WJHTC, plus the ability to travel and access the Key Site facility for software installation. As of mid-July 2020, none of these issues

Focus Area	Commitment	Original Date	2020 Update	New Date	Explanation
					have been resolved. Issues have been resolved, the TFMS program will move forward with implementation of R14 software build Q4 CY2021.
Northeast Corridor	FAA Implementation: Implement Eastern Seaboard high altitude PBN routes (including SID/STAR (Standard Instrument Departure/Standard Terminal Arrival Route) connectivity) through ZBW, ZNY and ZDC airspace	Q4 CY2020	Q4 CY2021	TBD	Due to COVID-19, access to FAA air traffic facilities has been limited to those whose entry is deemed necessary to carry out mission critical activities. The implementation of the Eastern Seaboard high altitude PBN route structure requires extensive training for all five east coast Air Route Traffic Control Centers. We have achieved 85% completion of this initiative since February 2021. To conduct such training, a cadre of contract support personnel must be permitted access to each facility's training labs. As such, air traffic facilities will not be able to safely conduct training until early 2021.
Northeast Corridor	FAA Implementation: Implement PDRR/ABRR (Pre-Departure Reroutes/Airborne Reroutes) enhancements	Q4 CY2020	TBD	Q4 CY2021	Software changes are under development, however this milestone has been delayed due to COVID-19. The TFMS program is unable to meet the planned date as this commitment is dependent on completion of an Operational Test and Evaluation at William J. Hughes Technical Center, the ability to travel and access the Key Site facility for software installation, and an operational keysite test. As of mid-July 2020, none of these issues have been resolved. Issues have been resolved, the TFMS program will be moving forward with implementation of R14 software build in Q4 of CY2021.

Focus Area	Commitment	Original Date	2020 Update	New Date	Explanation
Northeast Corridor	FAA Implementation: Improve Arrival Time-Based Management (TBM) to PHL	Q4 CY2021	N/A	Q4 CY2023	Due to the EWR Airspace initiative and COVID-19 impact to facilities this has been re-planned. We are combining the PHL and EWR metering initiatives since it will be the same facility after Sept 2021.
Northeast Corridor	Industry: Conduct GBAS (Ground Based Augmentation System) evaluation/assessment at BOS	Q2 CY2020	Q4 CY2021	N/A	Due to COVID-19, this industry milestone is unlikely to be viable within the timeframe of the NJIP, and its removal will be discussed with the NAC in June 2021.
Northeast Corridor	Industry: Continue to support ongoing design work and implementation of Eastern Seaboard high altitude PBN routes (including SID/STAR connectivity) through ZBW, ZNY and ZDC airspace	Q4 CY2020	Q4 CY2021	TBD	Due to COVID-19, the FAA milestone for implementation is being rescheduled, thus the industry milestone is similarly affected.
Northeast Corridor	Industry: PANYNJ will begin to install non-federal GBAS at LGA and JFK	Q4 CY2020	TBD	Q1 CY2023	Due to COVID-19, this industry milestone has been rescheduled and redefined to reflect the projected start of installation.
Northeast Corridor	Industry: Create additional BOS tower space for TFDM equipment to ensure surface metering	Q4 CY2021	N/A	TBD	Due to COVID-19, the waterfall for the TFDM program is being redefined. This industry milestone will be updated once the schedule for BOS implementation is identified.

SUMMARY OF ACCOMPLISHMENTS TO DATE

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2022* **Completions: CY2019 through Q1 CY2021**
Multiple Runway Operations	**CY2019** **FAA** ▪ CWT separation standards: BOS ▪ CWT separation standards: DFW ▪ CSPO collision risk safety study for HUR ▪ Operator guidance material on wake turbulence encounter reporting ▪ CSPO feasibility and initial safety analysis for departures ▪ CWT separation standards (5 sites): MSP; MIA; LAX; SCT; PHL ▪ Dynamic wake separation research ▪ ORD wake encounter and mitigation analysis **Industry** ▪ Provide input and review feasibility and initial safety analysis for CSPO departure concepts **CY2020** **FAA** ▪ Analysis of use of RNAV (VNAV) (Vertical Navigation) approaches for 7110.308 at SFO ▪ Reduced minimum radar separation (MRS) feasibility study ▪ CSPO feasibility and initial safety analysis for arrival and departures ▪ CWT separation standards (4 sites): DTW; IAH; CVG; ANC **Industry** ▪ Wake turbulence encounter reporting ▪ Provide input and review feasibility study of reduced minimum radar separation ▪ CWT benefits analysis **CY2021** **FAA** ▪ CWT separation standards (3 sites): SDF; CLT; MEM

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2022* **Completions: CY2019 through Q1 CY2021**
Performance Based Navigation	**CY2019** **FAA** ▪ Implement Metroplex at LAS: 100% design complete ▪ Implement Metroplexes at South/Central Florida, SID and STAR: 100% design complete **CY2020** **FAA** ▪ Implement Metroplex at CLE/DTW: Post-implementation phase complete (Completed early Q4 2019) ▪ Joint analysis with industry on potential barriers that inhibit the consistent use of EoR (Established on Required Navigation Performance) procedures at six NSG (Navigation Service Group) 1–4 airports in the NAS (Completed early Q4 2019) ▪ Implement Metroplex at DEN: Implementation phase start ▪ Implement Metroplex at DEN: Implementation phase complete ▪ Implementation phase start of Las Vegas Metroplex ▪ Implementation phase start of Florida Metroplex **CY2021** **FAA** ▪ Complete Implementation of Las Vegas Metroplex ▪ Post-implementation complete of Denver Metroplex
Surface and Data Sharing	**CY2019** **FAA** ▪ NASA ATD-2 interim technology transfer from Phase 2: Fused IADS (Integrated Arrival/Departure/Surface) at CLT **Industry** ▪ Participate and provide input during recurring SWIFT meetings (2) ▪ Review TFDM waterfall and denote airports that have a significant non-CDM (collaborative decision-making) flight operator presence **CY2020** **Industry**

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2022* **Completions: CY2019 through Q1 CY2021**
	▪ Participate and provide input during recurring SWIFT meetings (2)
Data Comm	**CY2019** **FAA** ▪ Deploy Tower services to an additional seven (7) towers: ADW; RNO; BUF; CHS; CMH; RSW; VNY ▪ Initial Operating Capability (IOC) at Kansas City and Indianapolis ARTCCs and 24x7 operations at Washington ARTCC ▪ Recommendation for target equipage rates for follow-on capabilities ▪ Loadability solution for runway SID **Industry** ▪ Recommendation for regional jet equipage strategy ▪ Recommendation for target equipage rates for follow-on capabilities ▪ Airlines to equip 1,900 aircraft
Northeast Corridor	**CY2019** **FAA** ▪ Expand consistent usage of defined and existing capping and tunneling for departures/arrivals to/from the NEC ▪ Improve airborne metering to PHL ▪ Conduct feasibility study to create process to reduce and/or eliminate passback Miles-in-Trail (MIT) for departures from NY ▪ Complete concept assessment to deconflict LGA/EWR/TEB when on LGA 13ILS ▪ Complete review/update adaptation for improving airborne metering to PHL ▪ Complete TBFM refresher training for metering to PHL ▪ Evaluate design alternatives to GLDMN/NTHNS RNAV SIDs to address noise concerns ▪ Conduct feasibility assessment of EoR simultaneous operations to JFK 13R RNP (Required Navigation Performance) and 13L ILS ▪ Complete concept analysis for TEB RW19 RNAV SID for overnight operations ▪ Conduct concept exploration of simultaneous operations on widely-spaced approaches to different airports ▪ Implement TBFM pre-departure scheduling at a selected airport (PIT to PHL) ▪ Determine viability and model ZDC airspace redesign alternatives (Completed early in Q1 CY2019)

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2022* **Completions: CY2019 through Q1 CY2021**
	▪ Conduct analysis to determine sequence of remaining airports to receive en route metering (Completed early Q2 CY2019) ▪ Evaluate LGA31 RNAV approach design alternatives that approximate LGA 31 EXPWY VIS approach and are usable for most operators ▪ Complete concept assessment for EWR 22L/29 arrival operations ▪ Implement Converging Runway Display Aid (CRDA) application for PHL 27R/35 for RNAV Approaches ▪ Benefits assessment for gate docking technologies to improve surface management ▪ Joint Industry/FAA to assess opportunities to expand use of CDTI-assisted (Cockpit Display of Traffic Information) operations beyond CAVS (CDTI Assisted Visual Separation) (Completed early Q2 CY2019) ▪ Joint Industry/FAA to complete EFVS (Enhanced Flight Vision System) benefits studies to determine requirements for reaching CAT II/III equivalent operations in NEC ▪ Joint industry/FAA milestone to complete studies to analyze effects of mixed EFVS equipage aircraft operations in NEC **Industry** ▪ Provide input and review concept assessment to deconflict LGA/EWR/TEB when on LGA 13 ILS ▪ Provide input to the evaluation of alternatives to GLDMN/NTHNS RNAV SIDs to address noise concerns ▪ Provide input and review feasibility assessment of EoR (Established on Required Navigation Performance) simultaneous operations using JFK 13 RNAV (RNP) and 13L ILS approaches ▪ Provide input and review concept analysis for TEB RW19 RNAV SID for overnight operations ▪ Identify and prioritize applications in the NY area for simultaneous operations on widely-spaced approached to different airports to expedite addressing deconfliction issues ▪ Participate in concept exploration of simultaneous operations on widely-spaced approaches to different airports ▪ Complete training of airspace user personnel to support TBFM pre-departure scheduling ▪ Provide input on ZDC airspace redesign alternatives to reduce traffic management restrictions

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2022* **Completions: CY2019 through Q1 CY2021**
	▪ Provide input to evaluation of designs for LGA31 RNAV approach that approximates the LGA31 EXPWY V15 approach and is usable for most operators ▪ Work with FAA to mitigate climb gradient concerns to the GLDMN/NTHNS RNAV SIDs ▪ Provide input and review concept assessment for EWR 22L/29 arrival operations ▪ NBAA (National Business Aviation Association) will support design of northbound and southbound escape routes ▪ PANYNJ (Port Authority of New York and New Jersey) will create new high speed exit on JFK runway 31R to reduce ROT (Runway Occupancy Time) ▪ PANYNJ with industry will conduct a review of existing PBN procedures, determine operator issues, identify needed modifications and prioritize needed changes ▪ Southwest Airlines commits to providing improved aircraft intent data via surface data elements ▪ Joint Industry/FAA to assess opportunities to expand use of CDTI-assisted operations beyond CAVS ▪ Joint Industry/FAA to complete studies to analyze effects of mixed EFVS equipage aircraft operations in the NEC ▪ Joint Industry/FAA to complete EFVS benefits studies to determine requirements for reaching Cat II/III equivalent operations in NEC **CY2020** **FAA** ▪ Implement ZNY offshore PBN routes (Completed early Q4 2019) ▪ Conduct IDRP (Integrated Departure Route Program) prototype re-familiarization session ▪ Conduct CRDA feasibility analysis for EWR 22L/11 to lower minima ▪ Conduct CRDA feasibility analysis for EWR 4R/29 to lower minima ▪ Conduct analysis to evaluate the impact and benefit of applying 7110.308 at EWR ▪ Conduct operational analysis to identify enhancements to improve data driven TFM decision-making **Industry** ▪ Support design and implementation of ZNY offshore PBN routes (Completed early Q4 2019)

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2022* **Completions: CY2019 through Q1 CY2021**
	▪ Provide input and review CRDA feasibility analysis EWR 22L/11 to lower minima ▪ Provide input and review CRDA feasibility analysis for EWR 4R/29 to lower minima ▪ Provide input and review of FAA evaluation of impact and benefit of applying 7110.308 at EWR ▪ Provide input and review operational analysis to identify enhancements to improve data driven TFM decision-making ▪ FedEx will provide improved aircraft intent data via surface data elements ▪ Conduct assessment of additional PHL 27L high-speed exits ▪ Conduct assessment of PHL 27R departure queue taxiway ▪ Conduct assessment of PHL taxiway extension for end around operations ▪ Conduct the assessment of DCA north end hold pads
TOTAL	To date, CY2019 through Q1 CY2021 commitments: 111 of 111 completed with a 100% completion rate **NOTE**: 30 commitments remain in TBD status

Acronym List and Airport Codes

Acronym	Definition
ARTCC	Air Route Traffic Control Centers
ATC	Air Traffic Control
ATD-2	Air Space Technology Demonstration
CAVS	Cockpit Display of Traffic Information (CDTI) Assisted Visual
CDTI	Cockpit Display of Traffic Information
CDM	Collaborative Decision-Making
CEDAR	Comprehensive Electronic Data Analysis and Reporting
CO2	Carbon Dioxide
CONUS	Continental United States
COVID-19	Coronavirus Disease 2019
CRDA	Converging Runway Display Aid
CSPO	Closely Spaced Parallel Runway Operations
CWT	Consolidated Wake Turbulence
CY20xx	Calendar Year 20xx
DCA	Ronald Reagan Washington National Airport
DCL	Departure Clearance
DSP	Departure Spacing Program
EDC	En Route Departure Capability
EFVS	Enhanced Flight Vision System
EoR	Established on Required Navigation Performance
EXPWY VIS	Expressway Visual
FAA	Federal Aviation Administration
FANS	Future Air Navigation System
FY20xx	Fiscal Year 20xx
GBAS	Ground Based Augmentation System
GPS	Global Positioning System
HUR	High Update Rate
IADS	Integrated Arrival/Departure/Surface
IDAC	Integrated Departure Arrival Capability
IDRP	Integrated Departure Route Program
ILS	Instrument Landing System
IMC	Instrument meteorological conditions
IOC	Initial Operating Capability
ISD	In-Service Division
iTBO	Initial Trajectory Based Operations
JAT	Joint Analysis Team
kg	Kilograms
MIT	Miles-in-Trail
MRS	Minimum Radar Separation
NAC	NextGen Advisory Committee
NAS	National Airspace System
NASA	National Aeronautics and Space Administration

Acronym	Definition
NBAA	National Business Aviation Association
NEC	Northeast Corridor
NIWG	NextGen Integration Working Group
NSG	Navigation Service Group
OPD	Optimized Profile Descent
PANYNJ	Port Authority of New York and New Jersey
PBN	Performance Based Navigation
PDRR/ABRR	Pre-Departure Reroutes/Airborne Reroutes
RECAT	Recategorization
RNAV	Area Navigation
RNP	Required Navigation Performance
ROT	Runway Occupancy Time
SCIA	Simultaneous Converging Instrument Approaches
SID	Standard Instrument Departure
STAR	Standard Terminal Arrival Route
SWIFT	SWIM Industry-FAA Team
SWIM	System Wide Information Management
TBFM	Time Based Flow Management
TFDM	Terminal Flight Data Manager
TFM	Traffic Flow Management
TRACON	Terminal Radar Approach Control Facilities
VNAV	Vertical Navigation

Airport	Definition
ADW	Joint Base Andrews (AFB)
ATL	Southeast Region, Atlanta Metroplex
BOS	Boston Logan International Airport
BUF	Buffalo Niagara International Airport
CHS	Charleston (SC) International Airport
CLE	Cleveland Hopkins International Airport
CLT	Charlotte Douglas International Airport
CMH	John Glenn Columbus International Airport
DEN	Denver International Airport
DFW	Dallas/Fort Worth International Airport
DTW	Detroit Metropolitan Wayne County Airport
EWR	Newark Liberty International Airport
HPN	Westchester County Airport
JFK	John F. Kennedy International Airport
LAS	Las Vegas Metroplex
LAX	Los Angeles International Airport
LGA	LaGuardia Airport
MIA	Miami International Airport
MSP	Minneapolis St. Paul International Airport
ORD	Chicago O'Hare International Airport
PHL	Philadelphia International Airport
PHX	Phoenix Sky Harbor International Airport
PIT	Pittsburgh International Airport
RNO	Reno-Tahoe International Airport
RSW	Southwest Florida International Airport (Ft. Myers)
SCT	Southern California TRACON
SFO	San Francisco International Airport
TEB	Teterboro Airport
VNY	Van Nuys Airport
ZBW	Boston Air Route Traffic Control Center
ZDC	Washington Air Route Traffic Control Center
ZID	Indianapolis Air Route Traffic Control Center
ZKC	Kansas City Air Route Traffic Control Center
ZNY	New York Air Route Traffic Control Center