Federal Aviation Administration

NextGEN

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

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

Teri L. Bristol Digitally signed by Teri L. Bristol
Date: 2020.08.05 09:48:26 -04'00'

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

JODI L BAKER Digitally signed by JODI L BAKER
Date: 2020.08.04 12:39:36 -04'00'

Jodi Baker, Acting Deputy Associate Administrator for Aviation Safety Date

PAMELA D WHITLEY Digitally signed by PAMELA D WHITLEY
Date: 2020.08.05 13:47:58 -04'00'

Pamela Whitley, Acting Assistant Administrator for NextGen Date

EXECUTIVE SUMMARY

The Federal Aviation Administration (FAA) and the aviation community have been collaborating on the successful implementation of NextGen in the National Airspace System (NAS) since 2009. The *NextGen Priorities Joint Implementation Plan CY2019−2021 Update* (Update) for the timeframe 2020 and 2021 is the result of a reassessment of the *NextGen Priorities Joint Implementation Plan CY2019−2021* (Plan).

In March 2020, the Federal government declared a public health emergency due to the global pandemic known as COVID-19 (Coronavirus Disease 2019). The aviation community and the airline industry, in particular, have experienced unprecedented disruption and volatility as a direct result of COVID-19.

However, NextGen Advisory Committee (NAC) industry technical partners have pledged their continued commitment to implementing the milestones in the *Joint Implementation Plan* and are committed to continued collaboration with the FAA through the NAC structure.

Consequently, the FAA reevaluated planned accomplishments associated with the *Joint Implementation Plan* for the years 2020 and 2021, and changes due to COVID-19 are identified within this document. Some emergency measures continue as this *Update* is being prepared, which may result in further refinement of planned accomplishments in the future.

The update process provides the FAA the flexibility needed to address the changing needs of the NAS and the aviation community at large. During regular reviews of the *Plan* over the last year, potential modifications to commitments began to emerge, such as new commitments or milestones, risk mitigation strategies, and program and operational re-prioritization.

This *Update* documents and codifies the changes that have been reported, discussed and agreed upon within each of the FAA and NAC technical teams through the NAC construct.

Notably, this *Update* is specific to FAA's modifications and supersedes all previous editions of the *Plan*.

SUCCESSES

During the calendar year 2019, the FAA and industry completed a combined 70 out of 71 *Joint Implementation Plan* commitments, producing useful and measurable benefits to industry and the NAS. Specifically, in that timeframe, the FAA completed 45 of 45 commitments; and industry completed 25 of 26 commitments.

Following are highlights of successes in each of the focus areas:

- Multiple Runway Operations
- Performance Based Navigation
- Surface and Data Sharing
- Data Communications
- Northeast Corridor

Multiple Runway Operations

Beginning in early 2019, the FAA committed to implementing the Consolidated Wake Turbulence (CWT) standard at eight TRACONS (Terminal Radar Approach Control Facilities). These eight TRACONS equate to the successful implementation of 77 towers associated with the TRACONS' airspace.

Implementation of CWT is planned to continue during the 2020 to 2021 timeframe. A benefits study to identify and understand the effects of the implementation is being coordinated with industry and the FAA. An initiative to increase the quantity and quality of wake turbulence reporting, led by the FAA, resulted in:

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

The benefit, long-term, of CWT will be to gain a better understanding of wake turbulence encounters and the effects of wake separation changes in the NAS to maintain an acceptable level of safety in operations.

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.

Performance Based Navigation

The FAA closed-out the Cleveland-Detroit Metroplex project on June 30, 2019. Success in PBN implementation was highlighted by the six-month post-implementation assessment of the September 13, 2018 implementation impacts at the Detroit Metropolitan Wayne County Airport (DTW) and delivery of the project post-implementation analysis. At Detroit, FAA implemented:

- Optimized arrival and departure routes
- New RNAV (Area Navigation) (RNP) (Required Navigation Performance) approaches
- Amended ILS (Instrument Landing System) and RNAV (GPS) (Global Positioning System) approaches
- Satellite airport arrival routes segregated from DTW
- Dual RNAV arrival from the corner-posts
- TBFM (Time Based Flow Management) scheduling
- Triple ILS approaches

There was an immediate impact on delay at DTW:

- Total delays for the six-month period following implementation decreased 36% compared to the 2012-2016 average
- Total delay minutes were reduced 58% compared to the 2012-2016 average

For Cleveland Hopkins International Airport (CLE), FAA implemented four RNAV STARs (Standard Terminal Arrival Route) and five RNAV SIDs (Standard Instrument Departure). At CLE, there was a clear drop in both altitude and heading commands (approximately 30 percent and 50 percent reduction, respectively), and a measured decrease in level-offs. At DTW, altitude and heading commands were also reduced (approximately 15 percent and 30 percent, respectively), and there was a shift in level-off to lower altitudes. The reduction in level-offs are the primary drivers in the reduction in fuel consumption of 1.8 million gallons for the project.

On March 26, 2020, the FAA implemented 29 new and 15 revised procedures at Denver International Airport and four satellite airports, including Centennial Airport, one of the busiest General Aviation airports in the system. FAA updated the RNAV SIDs and STARs initially implemented in 2012. The reduction from 16 to 8 RNAV STAR procedures greatly simplified STAR runway transition change assignments in the high-altitude environment. Post-implementation analysis is ongoing; and initial reports from ATC (Air Traffic Control) and pilots show a reduction in communications between ATC and the flight deck and increased opportunities to fly OPD (Optimized Profile Descent) procedures.

On May 21, 2020, FAA completed post-implementation amendments to the Florida enroute airway structure as part of the ongoing South-Central Florida Metroplex project. Twenty-six Q, Y, L and M-routes were amended and four new Y-routes implemented. This completes the enroute changes in Florida where 73 new and amended routes were implemented on November 10, 2018.

Surface and Data Sharing

Success in the focus area of Surface and Data Sharing is most visible in the increased industry involvement and technology investments, a few of which are highlighted below.

During the ATD-2 (Air Space Technology Demonstration) Tech Transfer Event in Dallas, Texas, NASA (National Aeronautics and Space Administration), in collaboration with the FAA, provided open-source software, operational procedures and lessons learned from their experience with the ATD-2 system at Charlotte International Airport. The tech transfer event showcased the benefits of surface data sharing and collaborative surface management. Flight and airport operators gained a deeper understanding of the technical and procedural requirements to conduct surface data sharing and surface management.

More airlines have connected to the FAA's TFM (Traffic Flow Management) Data request/reply service, allowing for the submission of new or additional surface data elements. In fact, the FAA's airline outreach efforts have resulted in an increased submission overall of new surface data elements (e.g., Earliest Off Block Time).

The FAA has made a concerted effort to enhance airline involvement in System Wide Information Management (SWIM) Industry-FAA Team (SWIFT) technical meetings to help all parties better understand the surface data elements and the process – and benefits – of on-ramping to SWIM services.

Data Communications

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.

Moreover, the number of operators participating has more than doubled, from 33 domestic and international operators in December 2016, to 81 domestic and international operators as of January 2020.

The steady increase of Data Communications Tower Operations over the past four years is illustrated in the table below.

Data Comm Tower Operations January 2016 through January 2020

Data Comm Tower benefits, as of April 2020, include:

- Prevented 18.2M Kgs of CO2 emissions
- Cleared 8,032,000+ flights
- Saved 2.18 million minutes of radio time
- 1,527,300+ minutes of airspace user time
- Prevented 123,890+ readback errors

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)

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."

In addition to the significant operational benefits and efficiencies realized in the Tower domain, Data Comm capabilities are now fully operational at two out of 20 ARTCCs (Air Route Traffic Control Centers) and in 24x7 operations at a third ARTCC. Data Comm En Route benefits are already being realized. These benefits, as of April 2020, include:

- Saved 125,680+ minutes of radio time
- Prevented 33,300+ readback errors

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.

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).

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 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.

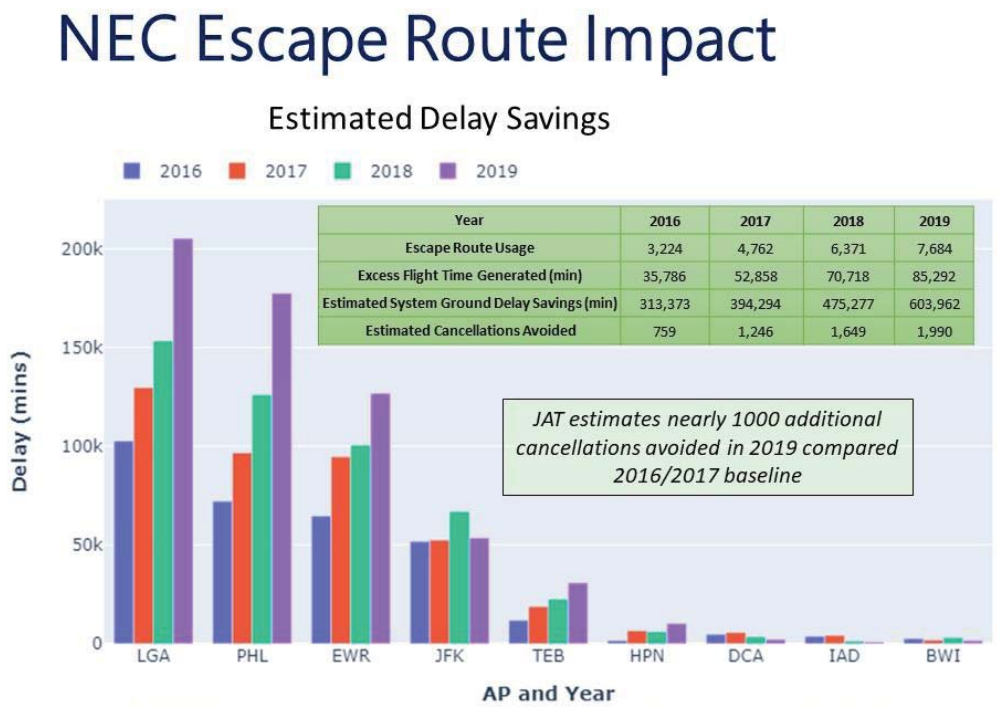
At PHL, Simultaneous Converging Instrument Approaches (SCIA) allow aircraft to land on PHL's converging runways (9R/17) in low visibility. Success is evidenced by the increase in arrival rate from 32 aircraft operations per hour (9R) to 48 aircraft operations per hour (9R/17). Moreover, an estimated 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.



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.

[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.

CHANGES

The FAA and industry have responded nimbly to changes in the operating environment as a result of NextGen successes. The success, year-over-year, of the execution of the three-year Plan(s) and the annual Update(s) has been instrumental in the continued evolution of the NAS.

Various factors influence changes to the *Joint Implementation Plan CY2019–2021*, such as:

- Identifying a new commitment to extend the work of completed accomplishments
- Modifying a commitment to more accurately reflect required resources and schedules
- Evaluating Pre-Implementation milestones for Implementation.

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

Focus Area	Commitment	Original Date	New Date	Explanation
Multiple Runway Operations	FAA Pre-Implementation: Separation Standards from CSPO HUR (Closely Spaced Parallel Operations High Update Rate) into 7110.65 Order	N/A	Added Q2 CY2021	The safety study for CSPO with HUR Surveillance showed that runway centerline spacing reductions are feasible to increase arrival capacity in the NAS, dependent of runway geometry and surveillance system capability. A document change proposal is being coordinated specific to the new centerline spacing requirements in the FAA Order 7110.65, with the target completion by Q2 CY2021. The anticipated benefits from these changes will increase arrival throughput at capacity constrained qualified airports during instrument meteorological conditions (IMC).
	FAA Implementation: CWT separation standards at 7 sites	Q4 CY2020	TBD	The implementation of CWT has been delayed due to COVID-19. This implementation requires workforce training and having facility access. As of the writing of this update, none of these issues have been resolved. Once a schedule for travel, training, and access to facilities can be established, a new commitment date will be provided.
	FAA Implementation: CWT separation standards at 5 sites	Q3 CY2021	TBD	The implementation of CWT has been delayed due to COVID-19. This implementation requires workforce training and having facility

Focus Area	Commitment	Original Date	New Date	Explanation
				access. As of the writing of this update, none of these issues have been resolved. Once a schedule for travel, training, and access to facilities can be established, a new commitment date will be provided.
Performance Based Navigation	FAA Implementation: Implement Metroplex at LAS (Las Vegas Metroplex): Implementation phase start	Q2 CY2020	Q4 CY2020	The change of the start date is due to COVID-19.
	FAA Implementation: Implement Metroplex at LAS (Las Vegas Metroplex): Implementation phase complete	Q3 CY2020	Q1 CY2021	This implementation has been moved to Q4 CY2020 due to COVID-19. This implementation requires in person workforce training and contractors having facility access.
	FAA Implementation: Implement Metroplex at LAS (Las Vegas Metroplex): Post-implementation phase complete	Q2 CY2021	TBD	This milestone is dependent upon the two phases preceding it – both of which are affected by COVID-19.
	Industry: Provide input, validate data, review findings and confirm conclusions to post-implementation analyses for implemented PBN procedures – LAS	Q4 CY2021	TBD	This milestone correlates with the above FAA implementation milestone to implement Metroplex at LAS, and is also subsequently delayed due to COVID-19.
Surface and Data Sharing	FAA Pre-Implementation: TFDM (Terminal Flight Data Manager) will complete operational testing for Build 1	Q2 CY2020	TBD	Due to COVID-19, the TFDM program cannot meet the original commitment date. Build 1 Operational Testing requires travel and access to the TFDM Lab in the Tech Center. As of the writing of this update, none of these issues have been resolved. Once a schedule for travel and access to the TFDM Lab has been established, the TFDM program will provide a new commitment date.
	FAA Pre-Implementation: NASA ATD-2 final technology transfer from Phase 3: Terminal departure IADS (Integrated Arrival/	Q3 CY2020	Q4 CY2021	The COVID-19 situation has significantly impacted data collection for the ATD-2 Phase 3 operational evaluation due to the dramatic reduction in traffic volume affecting the terminal demand/capacity imbalances that the

Focus Area	Commitment	Original Date	New Date	Explanation
	Departure/Surface) at DFW/DAL (Dallas/Ft. Worth International Airport)			ATD-2 system was designed to address. NASA leadership has considered these COVID-19 impacts on ATD-2 Phase 3 along with the significant in-kind investments made by airline field demo partners and the strong interest expressed by the broader airline community in seeing the Phase 3 field demo produce meaningful results. Consequently, NASA leadership has directed the ATD Project to extend ATD-2 work through FY21 with the goal of maximizing the impact of NASA and Field Demo Partner investments in ATD-2 Phase 3. Phase 3 operational evaluation with Technology Transfer #3 now is targeted for the end of FY2021.
	FAA Implementation: TFDM program will achieve key site IOC (Initial Operating Capability) for Build 1 at PHX (Phoenix Sky Harbor International Airport)	Q2 CY2020	TBD	Due to COVID-19, the TFDM program cannot meet the original Build 1 IOC commitment date. Build 1 IOC requires travel, training, installation of additional hardware/software, and access to the PHX facility. As of the writing of this update, none of these issues have been resolved. Once a schedule for travel, training, hardware/software installation, and access to the PHX facility has been established, the TFDM program will provide a new commitment date.
	FAA Implementation: TFDM program will achieve ISD (In-Service Division) for Build 1 to allow additional TFDM system deployments into the NAS	Q4 CY2020	TBD	Due to COVID-19, the TFDM program cannot meet the original Build 1 ISD commitment date. Build 1 ISD requires travel, access to the PHX facility, and completion of the previous IOC commitment. As of the writing of this update, none of these issues have been resolved. Once a schedule for the B1 IOC date is set, along with travel and PHX facility access permitted, the TFDM program will provide a new commitment date.
	FAA Implementation: TFDM program will achieve IOC at 3 additional sites	Q1 CY2021	TBD	Due to COVID-19, the TFDM program cannot meet the original commitment date to IOC at 3 additional sites. This commitment is

Focus Area	Commitment	Original Date	New Date	Explanation
				dependent on TFDM first achieving the B1 ISD commitment. After a date for the Build 1 ISD commitment is established, the TFDM program will be able to provide a new commitment date.
	FAA Implementation: TFDM program will achieve key site IOC for Build 2 at CLT (Charlotte Douglas International Airport)	Q2 CY2021	TBD	Due to COVID-19, the TFDM program cannot meet the original B2 IOC commitment date. This commitment is dependent on completing the B1 milestones, plus the ability to travel and access the CLT facility for hardware/software installation, testing and training. As of the writing of this update, none of these issues has been resolved. After new dates for the B1 milestones are set and travel and facility access issues resolved, the TFDM program will be able to provide a new commitment date.
	FAA Implementation: TFDM program will achieve ISD for Build 2 to allow additional deployments of the full TFDM capabilities into the NAS	Q3 CY2021	TBD	Due to COVID-19, the TFDM program cannot meet the original Build 2 ISD commitment date. Build 2 ISD requires travel, access to the CLT facility, and completion of the previous IOC commitment. As of the writing of this update, none of those are permitted for TFDM. As of the writing of this update, none of these issues have been resolved. After new dates for the B2 IOC commitments are set and travel and facility access issues resolved, the TFDM program will be able to provide a new commitment date.
	FAA Implementation: TFDM program will achieve IOC at five (5) additional sites	Q4 CY2021	TBD	Due to COVID-19, the TFDM program cannot meet the original commitment date to IOC at 5 additional sites. This commitment is dependent on TFDM first achieving the B2 ISD commitment. After a date for the Build 2 ISD commitment is established, the TFDM program will be able to provide a new commitment date.

Focus Area	Commitment	Original Date	New Date	Explanation
	Industry: Participate and provide input during recurring SWIFT meetings	Q2 and Q4 CY2020; Q2 and Q4 CY2021	TBD date and # of SWIFT meet-ings	The original number of SWIFT meetings for 2020 and 2021 totaled four, with one in Q2 CY202; one in Q4 CY2020; one in Q2 CY2021; and one in Q4 CY2021. Based on uncertainty in scheduling due to COVID-19, the actual number and type (e.g., virtual) of meetings will need to be evaluated.
	Industry: Collaborate with the FAA during all remaining CSIT visits (10 total)	Q2 and Q4 CY2020; Q2 and Q4 CY2021	TBD date and # of CSIT visits	The original number of CSIT visits totaled 10: two in Q2 CY2020; two in Q4 CY2020; three in Q2 CY2021; and three in Q4 CY2021. Based on uncertainty in scheduling due to COVID-19, the actual number and type (e.g., virtual) of visits will need to be evaluated.
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	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 CY2022, for baselining additional Data Comm services for En Route (Enhanced Services) utilizing the existing FANS 1/A message set. Extending the milestone one year 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	New Date	Explanation
	Industry Pre-Implementation: Baseline enhanced Data Comm services for En Route utilizing existing FANS 1/A message set	Q3 CY2021	Q3 CY2022	There may be additional delays to this milestone as a result of COVID-19 impacts to the Initial and Full Services deployment schedules.
	FAA Pre-implementation: IOC for Initial En Route Services at all 20 CONUS (Continental United States) Air Route Traffic Control Centers (ARTCC)	Q4 CY2021	Q4 CY2022	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 CY2022.
Northeast Corridor	FAA Implementation: Improved departure management for flights destined to LGA	Q2 CY2020	Q4 CY2020	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.
	FAA Implementation: Implement Departure Spacing Program (DSP) enhancements	Q4 CY2020	TBD	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 have been resolved.
	FAA Implementation: Implement Eastern Seaboard high altitude PBN routes (including SID/STAR (Standard Instrument Departure/Standard Terminal Arrival Route) connectivity)	Q4 CY2020	Q4 CY2021	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.

Focus Area	Commitment	Original Date	New Date	Explanation
	through ZBW, ZNY and ZDC airspace			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.
	FAA Implementation: Implement PDRR/ABRR (Pre-Departure Reroutes/Airborne Reroutes) enhancements	Q4 CY2020	TBD	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 WJHTC, 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. After travel and facility access is restored, the TFMS program will assess and provide a new commitment date.
	Industry: Conduct GBAS (Ground Based Augmentation System) evaluation/assessment at BOS	Q2 CY2020	Q4 CY2021	Due to COVID-19, this industry milestone has been moved to Q4 CY2021.
	Industry: Conduct assessment of DCA north end hold pads	Q3 CY2020	TBD	Due to COVID-19, this industry milestone will be rescheduled to a date to be determined.
	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	Due to COVID-19, the FAA milestone for implementation was rescheduled, thus the industry milestone is similarly affected.
	Industry: PANYNJ will install non-federal GBAS at LGA and JFK	Q4 CY2020	TBD	Due to COVID-19, this industry milestone will be rescheduled to a date to be determined.

SUMMARY OF ACCOMPLISHMENTS TO DATE

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2021* **Completions: CY2019 through Q1 CY2020**
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 **Industry** ▪ Wake turbulence encounter reporting
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** ▪ 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

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2021* **Completions: CY2019 through Q1 CY2020**
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
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

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2021* **Completions: CY2019 through Q1 CY2020**
	▪ 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) ▪ 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

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2021* **Completions: CY2019 through Q1 CY2020**
	▪ Complete training of airspace user personnel to support TBFM pre-departure scheduling ▪ Provide input on ZDC airspace redesign alternatives to reduce traffic management restrictions ▪ 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

Focus Area	*NextGen Priorities Joint Implementation Plan CY2019–CY2021* **Completions: CY2019 through Q1 CY2020**
	Industry ▪ Support design and implementation of ZNY offshore PBN routes (Completed early Q4 2019) ▪ 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 **CY2021** **Industry** ▪ Conduct assessment of PHL taxiway extension for end around operations
TOTAL	To date, CY2019 through Q1 CY2020 commitments: 87 of 88 completed with a 99% completion rate

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 Separation
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 Codes	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