# The Effect of Adopting the Next Generation Air Transportation System on Air Travel Performance

# Online Appendix A: Grandfather FAA Websites

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March 2023

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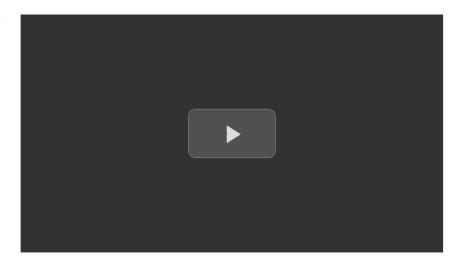
# FAA Home ▶ NextGen ▶ What is NextGen?

### What is NextGen?

NextGen is the FAA-led modernization of our nation's air transportation system. Its goal is to increase the safety, efficiency, capacity, predictability, and resiliency of American aviation. This overhaul brings together innovative technologies, capabilities, and procedures that improve how we fly from departure to arrival.

Airlines, general aviation operators, pilots, and air traffic controllers gain better information and tools that help passengers and cargo arrive at their destinations more quickly, while aircraft consume less fuel and produce fewer emissions. This transformation is being achieved through an ongoing rollout of improvements which began in 2007. NextGen remains on target to have all major components in place by 2025.

The modernization of the National Airspace System is one of the most ambitious infrastructure projects in U.S. history.



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Read the 2017 Joint Implementation Plan Update (PDF)

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# **NextGEN**

### **NextGen Priorities**

Under the 2017 NextGen Advisory Committee Charter, the FAA is pleased to report the successful implementation of 157 priorities as of September 2017, advancing work at target locations and producing useful and measurable benefits to industry and the U.S. National Airspace System (NAS). The last NextGen Priorities Joint Implementation Plan, 2017-2019 (PDF) was published in October 2016 and contained FAA-industry agreed milestones through 2019 in four focus areas: Multiple Runway Operations, Surface Operations and Data Sharing, Data Communications, and Performance Based Navigation. The 2017 Joint Implementation Plan Update (PDF) includes a new NextGen Priority area, the Northeast Corridor (NEC), the busy airspace between Washington, D.C., and Boston that includes Philadelphia and New York City



In February 2017, the NextGen Advisory Committee (NAC) voted to make the Northeast Corridor a NextGen Priority. The FAA, together with the NAC is focused on implementing NextGen in the Northeast Corridor, recognizing that making continuous improvements to the system in the Northeast operationally benefits the entire U.S. aviation system. The commitments herein are focused on the near-term goal to improve the execution of today's operations, taking a continuous improvement approach and using agreed-upon metrics.

The FAA and industry agree to keep collaborating through the NAC to update the commitments each year and roll the plan forward biannually. The consensus of the FAA and stakeholders represented on the NAC is that successful implementation of these commitments will help shape the future of NextGen and contribute to its long-term viability.

Both the FAA and industry have identified specific commitments within each of the focus areas to increase safety, reduce aviation's impact on the environment, enhance controller productivity, and increase predictability, airspace capacity, and efficiency. The FAA and industry will continue to monitor joint progress and be agile and flexible to make necessary adjustments to commitments. The FAA also has a monitoring and oversight process (PDF) detailing FAA's continued engagement with the NAC. For additional information please see the Reference Guide. The FAA and industry are committed to jointly evaluating the effects of these commitments on the NAS, led by the work of a Joint Analysis Team (JAT). This helps the FAA and industry understand the value of implementations in this plan.

Previous reports can be viewed at: NextGen Priorities Joint Implementation Plan, 2014-2017 (PDF) and NextGen Priorities October 2015 Joint Implementation Plan Update (PDF), and NextGen Priorities Joint Implementation Plan 2017-2019 (PDF).

### **Recent Updates**

As of August 31, 2018

### **Multiple Runway Operations**

Completed: Wake Recategorization at DTW in Q1-2018 Completed: Wake Recategorization at PHX and SAT in Q3-2018

### **Data Communications**

Completed: Departure Clearance Tower Service Initial Operating Capability at BNO in Q1-2018

Completed: Departure Clearance Tower Service Initial Operating Capability at CMH in Q2-2018

Completed: Departure Clearance Tower Service Initial Operating Capability at

Completed: Departure Clearance Tower Service Initial Operating Capability at CHS in Q2-2018

Completed: Departure Clearance Tower Service Initial Operating Capability at BUF in Q2-2018

### Northeast Corridor

Completed: Procedures — Update the Minima for Existing Simultaneous Converging Instrument Approaches (SCIA) Procedure to PHL 9R and 17 in Q3-2018

Completed: Tools - Implement Surface Visualization Tool (SVT) (ZBW) in Q2-

Completed: Tools - Implement En Route Departure Capability (EDC) in Q2-

Completed: Procedures - Atlantic Coast Routes: Design Validation of Eastern Seaboard High-Altitude PBN Routes, Including SID/STAR Connectivity in Q2-2018

Completed: Procedures - Assessment for Early TBFM Pre-Departure Scheduling in Q2-2018 Completed: Procedures — Design and Testing for Vertical Climb Escape Route

for TER/HPN in Q1-2018 Completed: Procedures - Design PBN Arrival and Departure Procedures for

NY Metro Area Airports from ZNY Oceanic in 21-2018 Completed: Procedures — Participate in Design Activities Associated with the New PBN Arrival and Departure Procedures for the ZNY Oceanic Transition Sectors at ZNY in Q1-2018

 ${\it Completed: Airports-JFK\ Runway\ 4R/22L\ Rehabilitation\ and\ Delay}$ Reduction Taxiway Improvements in Q1-2018



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### **Multiple Runway Operations**



To increase airport efficiency and reduce flight delays through the use of Multiple Runway Operations (MRO), the FAA and industry jointly commit to multiple projects nationwide. MRO capabilities improve access to runways and increase basic runway capacity and throughput by reducing aircraft separation standards. Improved access will enable more arrivals and/or departures during instrument meteorological conditions, which will increase efficiency and reduce flight delays.

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### **Performance Based Navigation**



With the new PBN NAS Navigation Strategy (PDF), the FAA will deliver new routes and procedures that primarily use satellite-based navigation and onboard aircraft equipment to navigate with greater precision and accuracy. The FAA will continue to improve air traffic flow in metropolitan areas and increase use of time based flow management decision support tools. The FAA commits to implementing multiple capabilities nationwide.

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### **Surface Operations and Data Sharing**



The FAA commits to implementing surface improvements through the development and deployment of Terminal Flight Data Manager (TFDM), by establishing a forum for meaningful engagement throughout the deployment, and by exchanging more data with additional stakeholders. The goal of these enhancements is to measurably increase predictability and provide actionable and measurable surface efficiency improvements.

### **Data Communications**



Data Communications (Data Comm) will provide direct digital communications services between pilots and air traffic controllers and enhance air traffic control information to airline operations centers. The capabilities will enhance safety by reducing communication errors, increasing controller productivity, increasing airspace capacity and efficiency while reducing delays, fuel burn and carbon emissions at towers nationwide. Data Comm is critical to the success of NextGen. enabling efficiencies not possible with the current voice system.

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### **Northeast Corridor**



The Northeast Corridor (NEC) covers the most congested airports and airspace in the United States, and has a significant effect on the daily operations of the national aviation system. Nearly 50 percent of aviation delays in the entire U.S. National Airspace System (NAS) are attributable to the Northeast Corridor. The commitments in this report identify near-term initiatives that will enhance operations and are focused on the NAC's stated goal to improve execution of today's operations. Given the complex and compact nature of NEC operations, and its connection to the rest of the NAS, single operational improvements can have significant savings in time and during weather events. These enhancements establish a foundation and framework for longer-term effective implementation of NextGen using time-based management techniques and precise repeatable Performance Based Navigation procedures for a more predictable and efficient

### Joint Analysis Team (JAT) Results

The Joint Analysis Team, a group of FAA and industry experts operating under the NextGen Advisory Committee, examines performance impacts and benefits that can be attributed to the implementation of NextGen capabilities

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# **Completion History**

Back to NextGen Priorities - Joint Implementation Plan Milestones

The Completion History chart below provides an update on the completed NextGen Priorities by Calendar Year and quarter. The NextGen Priorities are: Multiple Runway Operations (MRO), Performance Based Navigation (PBN), Surface

Date	Data Communications	Multiple Runway Operations	Performance Based Navigation	Surface Operations & Data Sharing
Q2 2017		Wake Recategorization: MIA	Established on Required Navigation Performance (EoR) Independent Operations Safety Analysis (RF Duals + Triples)     RNP 1 Departures: (BUR, SNA)	Data Sharing:     Flight Operator,     American Airlines     to provide data     for Charlotte     Surface     Departure     Management
Q1 2017		Wake     Recategorization:     MSP     Amend Dependent     Runway     Separations     (Runways > 4300'):     CVG; MEM; PHX;     SDF	Metroplex — Charlotte Metroplex — Las Vegas; Design Start Advanced RNP- Advisory Circular 90-105; Assess Potential Demo Sites; Design Guidance EoR Feasibility Assessment for Independent Duals and Triples Operations (RF and TF): ATL (TF); CLT (TF); DEN (RF); DFW (TF); IAH (RF); SDF (TF) EoR SEA Review New Vertical Guidance Criteria and Location Guidance Boeing to Provide Data on their Utility and Usability for GYY OPD JetBlue to Provide data on their Utility and Usability Data for BOS OPD	
Q4 2016	Departure Clearance Tower Service Initial Operating Capability: DAL; MCI; DFW; MDW; MKE; MSP; ORD; RDU; SJU     Implementation Framework for non-VHF Digital Link (VDL) Mode 2 Media	Wake Recategorization: PHL     Feasibility Assessment — Removal of Vertical Navigation Requirement for Simultaneous Independent Parallel Approaches Joint Analysis Team Performance Analysis Participation	Enhanced Flight     Vision Systems     (EFVS) Final Rule     (IND TBD)     Metroplex — Atlanta     TBFM Decision     Support Tools —     Ground-Based     Interval     Management (GIMS-S): 3 Sites     TBFM Decision     Support Tools —     Integrated Departure     Arrival Capability     (IDAC): 3 Sites     Advanced RNP-     Advisory Circular     90-105; Assess     Potential Demo     Sites; Design     Guidance	Data Sharing:     Flight Operators to Provide 11     Data Elements     Identify Forum for     On-Going     Industry     Engagement with     FAA Throughout     TFDM     Deployment

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Resources Community Involvement	Q2 2016	Departure Clearance Tower Service Initial Operating Capability: SAN; HPN; BNA; PHL; SNA; DEN; BUR; BOS; ONT; ATL; CLT; SFO; BDL; OAK	Wake Recategorization: SFO	Established on Required Navigation Performance Authorization Required (EoR RNP AR- Widely Spaced Operations) National Standard	FAA to Ingest 11     Data Elements     Via TFMS Update     Advanced     Electronic Flight     Strips: EWR
	Q1 2016	Extend Departure Clearance Operational Trials: EWR; MEM     Departure Clearance Tower Service Initial Operating Capability: MSY; AUS; SDF; EWR; SAT, JFK; LAX; LAS; IND; MEM; LGA; TEB	Wake Recategorization: IND     Assessment of Future Wake Recategorization Capabilities     Assessment to Implement Order 7110.308 and Dependent Parallel Operations (2500'— 3600'): BOS	Single Site     Assessment of Las     Vegas Basin: Study     Team	
	Q4 2015	Assessment of Boeing 737 Filight Management Computer Issue	Dependent Parallel Operations (2500'-3600'): DAL; JFK; MEM; MSP; PDX; RDU; SEA     Dual Independent Parallel Operations with Offset: ORD     Triple Independent Parallel Operations: ORD     Wake Recategorization: DEN	Established on RNP (EoR) Track-to-Fix (TF) of Fly-By Approaches Safety Analysis	
	Q3 2015	Departure Clearance Tower Service Implementation: SLC; HOU; IAH	Final Investment Decision for Wake Turbulence Mittgation for Departures     Dual Independent Parallel Operations with Offset: DTW.		Airport Operators as Collaborative Decision Making Participants     Simplifying Application for System Wide Information Management Data     Time Based Flow Management     "Wheels Up"     Procedural Change Using     New "Earliest Off Block Time" Data     Element
	Q2 2015		Wake Recategorization Phase 1: MDW; ORD	Metroplex: Northern California     Equivalent Lateral Spacing Operations (ELSO) National Standard	
	Q1 2015		Wake Recategorization Phase 1: New York TRACON (EWR, JFK, LGA, ISP, HPN, TEB); CLT     Safety Analysis for Wake Turbulence Mitigation for Arrivals — Procedures: ATL  7	Established on Required Navigation Performance Authorization Required (EoR RNP AR — Widely Spaced Operations): DEN	Advanced     Electronic Flight     Strips: CLE     System Wide     Information     Management     (SWIM) Surface     Visualization Tool     (SYT)     Deployment:     Boston TRACON,     Chicago TRACON,     Houston TRACON,     Louisville     TRACON, New     York TRACON     Feasibility     Assessment for     Terminal Flight     Data Manager     (TFDM) Program     Departure     Management

Q4 2014	Final Investment     Decision for En     Route Services:     Initial Services     Recorder Rule for     Retrofit	Safety Analysis of Order 7110.308 for Additional Airport: SFO 19L, 19R      Wake Recategorization Phase 1: IAH, HOU	Single Site     Assessment of Las     Vegas Basin	Feasibility     Assessment for     Electronic Flight     Data for New York     Advanced     Electronic Flight     Strips (AEFS)      Traffic Flow     Management     System (TFMS) &     Time-Based Flow     Management     (TBFM) New Data     Sharing via SWIM     Subscription:     TBFM, TFMS
23 2014		Wake     Recategorization     Phase 1: ATL, CVG      Dual Independent     Parallel Operations:     ATL      Safety Analysis for     Wake Turbulence     Mitigation for     Arrivals-     Procedures: PHL,     DTW		Surface     Surveillance     Event Data     Distribution to     users via SWIM     (ASDE-X/ASSC):     SFO

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The FAA is moving to a performance based navigation (PBN) National Airspace System (NAS) and has published the NAC-endorsed PBN NAS Navigation Strategy (PDF). With PBN, the FAA delivers new routes and procedures that primarily use satellite-based navigation and on-board aircraft equipment to navigate with greater precision and accuracy. PBN provides a basis for designing and implementing automated flight paths and redesigning airspace near obstacles for increased access. Benefits include shorter and more direct flight paths, improved airport arrival rates, enhanced controller productivity, increased safety due to repeatable and predictable flight paths, fuel savings, and a reduction in aviation's adverse environmental impact. These commitments are a subset of the overall series of PBN activities the FAA is planning to implement.

# Select a Focus Area Performance Based Nav Go

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### **Joint Analysis Team Findings**

The Joint Analysis Team (JAT) evaluated Performance Based Navigation (PBN) Metroplex implementation in North Texas and PBN Established on Required Navigation Performance (EoR) at Denver International Airport (DEN). Full details on methodology and findings can be found in the Joint Analysis Team: Performance Assessment of North Texas Metroplex and Established on RNP in Denver (PDF) report.

The JAT performed a follow-up study on the evaluation of fuel analysis for the North Texas Metroplex. Full details on methodology and findings can be found in the Joint Analysis Team: Performance Assessment of Wake ReCat in Indianapolis and Philadelphia and Fuel Analysis for North Texas Metroplex (PDF) report.

Additionally, the JAT evaluated Optimal Profile Descent (OPD) implementations at Boston Logan International Airport (BOS) and Gary/Chicago International Airport (GYY). Full details on methodology and findings can be found in the Joint Analysis Team: Performance Assessment of Boston/Gary Optimal Profile Descents and DataComm (PDF).

### **Implementation Commitment**

	2014		2015				2016				2017				2018				2019			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Established on Required Navigation Performance Authorization Required (EoR RNP AR - Widely Spaced Operations)			DEN																			
Metroplex - Atlanta																						
Metroplex - Charlotte											•											
Metroplex - Las Vegas; Design Start											•											
Metroplex - Northern California				NorCal																		
Single Site Implementations									BOS GYY					AUS HND								
TBFM Decision Support Tools - Ground-Based Interval Management (GIM-S)										3 Sites			3 Sites									
TBFM Decision Support Tools - Integrated Departure Arrival Capability (IDAC)										3 Sites								1 Site				4 Sites
TBFM Decision Support Tools - Terminal Sequencing and Spacing (TSAS)																						

All dates are in calendar years.

● Implemented ■ On track New/Revised ▲ Delayed 📓 Dependent 🖨 Removed

### **Pre-Implementation Commitment**

	2014		2015				2016				2017				2018				2019			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Advanced RNP- Advisory Circular 90-105; Assess potential demo sites; Design Guidance								•		•	•											
EDO If Positive EDO Assessment, Authorization to Operate														ATL DFW								
Enhanced Flight Vision Systems (EFVS) Final Rule (IND TBD)										•												
EoR Feasibility Assessments for Independent Duals and Triples Operations (RF and TF)											ATL (TF) CLT (TF) DEN (RF) DFW (TF) IAH (RF) SDF (TF)											
EOR If 5.9.7 is Achieved and Applicable; Begin EOR Operations with Modified RF Procedures at DEN and IAH													DEN			IAH						
EoR if Favorable Outcome of Independent Duals/Triples Safety Analysis; Develop and Approve Document Change Proposal (DCP) to 7110.65 paragraph 5.9.7																						
EoR Independent/Dependent Operations Capacity Analysis												•										
EoR SEA Review											•											
EoR Dependent Operations Safety Assessment																<b>▲</b> EoR						
EoR Feasibility Assessment: Concurrent Use of Track to Fix and Radius to Fix																EoR						
EoR RF/TF to xLS Safety Analysis																<b>▲</b> EoR						
EoR Site Selection Decision																<b>▲</b> EoR						
EoR — Aircraft Equipage Inventory - Analyses of aircraft equipage inventory, VNAV causal factors, equipage strategy, and identification of subsequent actions																						
Equivalent Lateral Spacing Operations (ELSO) National Standard				•																		
Established on Departure Operations (EDO) Feasibility Assessment													•									
Established on RNP (EoR) Track-to-Fix (TF) of Fly-By Approaches Safety Analysis						•																
Established on Required Navigation Performance (EoR) Independent Operations Safety Analysis (RF Duals + Triples)												•										
Established on Required Navigation Performance Authorization Required (EOR RNP AR - Widely Spaced Operations) National Standard								National Standard														
New Vertical Guidance Criteria and Location Guidance											•											
RNP 1 Departures												BUR SNA										
Single Site Assessment of Las Vegas Basin		•					Study Team															



### **Industry Commitments**

	2014		2015				2016				2017				2018	В			2019			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
American to Provide Data on their Utility and Usability for Charlotte Metroplex Procedures														CLT								
Boeing to Provide Data on their Utility and Usability for GYY OPD											GYY											
Delta to Provide Data on their Utility and Usability for ATL EDO																ATL EDO						
Delta to Provide Data on their Utility and Usability for Atlanta Metroplex Procedures														ATL								
Delta to Provide Data on their Utility and Usability for DFW EDO																DFW EDO						
FedEx to Provide data on their Utility and Usability for EFVS IND														EFVS IND								
JetBlue to Provide Data on their Utility and Usability Data for BOS OPD											BOS											
NBAA to Provide Data on their Utility and Usability for HND RNAV SID																HND						
NBAA to Provide Data on their Utility and Usability for Las Vegas Metroplex																						LAS
PBN Lead Operator Roles Redefined - FAA will Lead Documentation Effort with Support from the Aviation Community												•										
Southwest to Provide Data on their Utility and Usability for AUS OPD																AUS						
Southwest to Provide Data on their Utility and Usability for DEN RF																	DEN RF					
United to Provide Data on their Utility and Usability for IAH RF																	IAH RF					

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### NextGen Priorities - Surface Operations and Data Sharing

Some of the greatest efficiencies can be gained while an aircraft is still on the ground and at the gate, and when connecting the surface to the enroute airspace. The FAA commits to implementing near-term surface improvements, sharing more data with stakeholders, and completing feasibility assessments of some other capabilities of interest. The goal of these enhancements is to measurably increase predictability and provide actionable and measurable surface efficiency improvements. These commitments are a subset of the overall series of programs and activities the FAA is planning to improve operations in these domains.

2014

2015



2019

### **Implementation Commitment**

Subscription

							_0.0								_0.0							
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Advanced Electronic Flight Strips (AEFS)			CLE ATCT					EWR ATCT	LAS AT													
FAA to Increase Data Sharing providing Surface Surveillance MLAT CAT 10 data (MA and Incidental NMA) to Industry via SWIM														•								
FAA to ingest 11 Data Elements via TFMS Update								•														
Surface Departure Management Demonstration Charlotte (ATD-2)														•								
Surface Surveillance Event Data Distribution to Users via SWIM (ASDE-X/ASSC)	SFO																					
System Wide Information Management (SWIM) Surface Visualization Tool (SVT) Deployment			Chicag Housto Louisvi	TRACC o TRAC on TRAC lle TRAC ork TRA	ON CON																	
Traffic Flow Management System (TFMS) & Time- Based Flow Management (TBFM) New Data Sharing via SWIM		TBFM TFMS																				

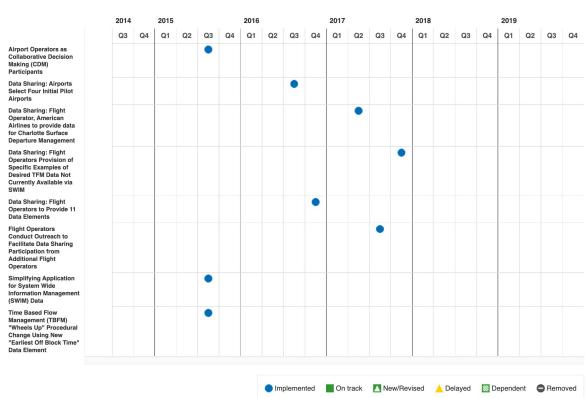
2017

2016

 New/Revised Implemented On track Delayed Dependent Removed All dates are in calendar years.

### **Pre-Implementation Commitment** 2015 2016 2017 2018 2019 Q3 Q1 Q1 Q2 Q1 Q2 Q1 Q2 Q3 Q1 Q4 Q2 Q3 Q4 Q3 Q4 Q3 Q4 Q4 Q2 Q3 Q4 Feasibility Assessment for Electronic Flight Data for New York Advanced Electronic Flight Strips Feasibility Assessment for Terminal Flight Data Manager (TFDM) Program Departure Management Identify Forum for On-Going Industry Engagement with FAA Throughout TFDM Plan to Deliver TFDM Capabilities to Key Sites as Early as Possible Plan to Move Up the TFDM Build that Subsumes DSP within the Overall TFDM Waterfall Restoration of Original FY18-20 Funding for the TFDM Program and Contract Award ● Implemented ■ On track New/Revised Delayed Dependent Removed All dates are in calendar years.

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### **NextGen Priorities – Data Communications**

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### **Schedule and Stats**

### List of capabilities and their implementation status

NOTE: The site milestones in the table below represent accelerated challenge dates which are ahead of the baseline milestones for the program.

Key Sites (3 towers)	Site Name	Site ID	ARTCC ID	IOC (CY)	Status
Group A (19 towers)	KS 1: Salt Lake City	SLC	ZLC	Q3 2015	•
Circup A (13 towers)	KS 2: Houston Intcl	IAH	ZHU	Q3 2015	•
Group B (15 towers)	KS 3: Houston Hobby	HOU	ZHU	Q3 2015	•
Group C (18 towers)					
Group D (7 towers)					

### **Implementation Commitment**

	2014		2015				2016				2017				2018				2019			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Baselines-Segment 1 Phase 1 Tower Services and Segment 1 Phase 2 En Route Initial Services										DAL DFW MCI MDW MKE MSP ORD RDU SJU STL				ADW	RNO	BUF CHS CMH RSW	VNY					
Initial Operating Capability (IOC) for Initial En Route Services at first Air Route Traffic Control Center (ARTCC)																						

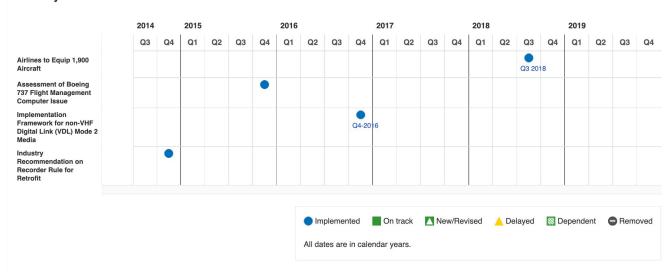
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Group A (19 towers)	
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Group C (18 towers)	
Group D (7 towers)	

Site Name	Site ID	ARTCC ID	IOC (CY)	Status
New Orleans	MSY	ZHU	Q1 2016	•
Austin	AUS	ZHU	Q1 2016	•
San Antonio	SAT	ZHU	Q1 2016	•
Los Angeles	LAX	ZLA	Q1 2016	•
Las Vegas	LAS	ZLA	Q1 2016	•
San Diego	SAN	ZLA	Q2 2016	•
John Wayne	SNA	ZLA	Q2 2016	•
Burbank	BUR	ZLA	Q2 2016	•
Ontario	ONT	ZLA	Q2 2016	•
San Francisco	SFO	ZOA	Q2 2016	•
Oakland	OAK	ZOA	Q2 2016	•
San Jose	SJC	ZOA	Q3 2016	•
Sacramento	SMF	ZOA	Q3 2016	•
Phoenix	PHX	ZAB	Q3 2016	•
Albuquerque	ABQ	ZAB	Q3 2016	•
Portland	PDX	ZSE	Q3 2016	•
Seattle	SEA	ZSE	Q3 2016	•
Dallas Love	176AL	ZFW	Q4 2016	•
Dallas FTW (x2)	DFW	ZFW	Q4 2016	•

### **Implementation Commitment** 2014 2015 2016 2017 2018 2019 Q3 Q4 Q1 Q2 Q3 Q4 DAL RNO BUF VNY ADW DFW CHS MCI СМН Baselines-Segment 1 Phase 1 Tower Services and Segment 1 Phase 2 En Route Initial Services MDW RSW MKE MSP ORD RDU SJU Initial Operating Capability (IOC) for Initial En Route Services at first Air Route Traffic Control Center (ARTCC) ■ Implemented On track New/Revised Delayed Dependent Removed All dates are in calendar years. **Pre-Implementation Commitment** 2014 2015 2016 2017 2018 2019 Q3 Q1 Q1 Q1 Q1 Q1 Q4 Q2 Q3 Q4 Extend Departure Clearance Operational Trials EWR MEM Final Investment Decision (FID) for En Route Services INITIA FULL SERVICES SERVICES Implementation Framework for non-VHF Digital Link (VDL) Mode 2 Media Q4-2016 ■ Implemented On track New/Revised Delayed Dependent Removed All dates are in calendar years. **Industry Commitments** 2015 2016 2017 2018 2019 Q3 Q1 Q1 Q1 Q1 Q3 Q4 Q1 Q4 Q2 Q3 Q4 Q2 Q3 Q4 Q2 Q3 Q4 Q2 Q2 Q3 Q4 Airlines to Equip 1,900 Aircraft Q3 2018 Assessment of Boeing 737 Flight Management Computer Issue Implementation Framework for non-VHF Q4-2016 Digital Link (VDL) Mode 2 Media Industry Recommendation on Recorder Rule for Retrofit ● Implemented On track New/Revised Delayed Dependent Removed

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Minn-St. Paul

Key Sites (3 towers)	Site Name	Site ID	ARTCC ID	IOC (CY)	Status
Group A (19 towers)	Louisville	SDF	ZID	Q1 2016	•
Circup A (13 towers)	Indianapolis	IND	ZID	Q1 2016	•
Group B (15 towers)	Memphis	MEM	ZME	Q1 2016	•
Group C (18 towers)	Nashville	BNA	ZME	Q2 2016	•
0	Denver	DEN	ZDV	Q2 2016	•
Group D (7 towers)	Atlanta	ATL	ZTL	Q2 2016	•
	Charlotte	CLT	ZTL	Q2 2016	•
	Orlando	MCO	ZJX	Q2 2016	•
	Miami	MIA	ZMA	Q3 2016	•
	Fort Lauderdale	FLL	ZMA	Q3 2016	•
	Tampa	TPA	ZMA	Q3 2016	•
	St. Louis	STL	ZKC	Q3 2016	•
	San Juan	SJU	ZMA	Q4 2016	•
	Kansas City	MCI	ZKC	Q4 2016	•

MSP

ZMP

Q4 2016

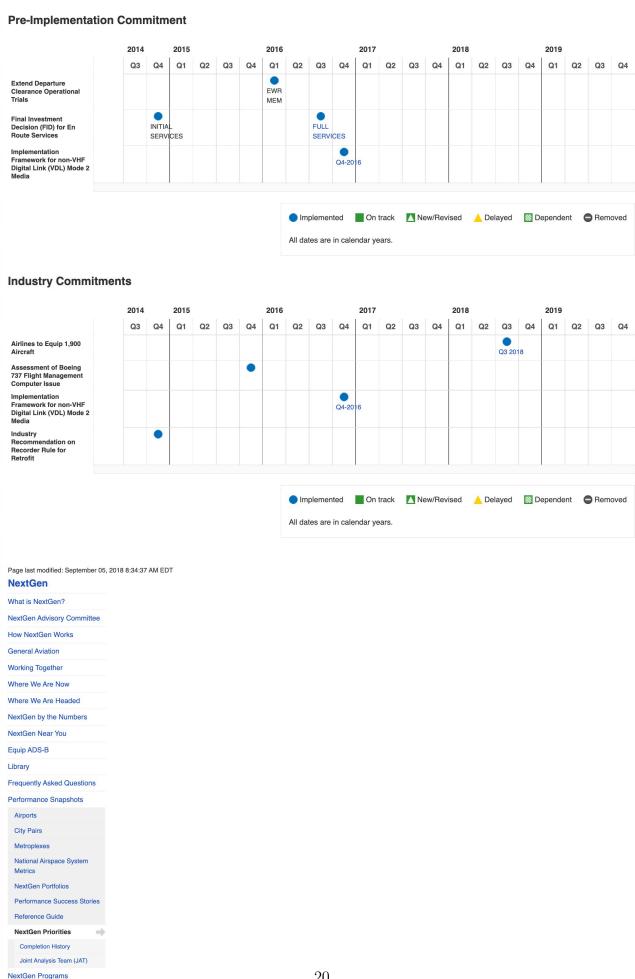
■ Implemented ■ On track New/Revised A Delayed New Dependent Removed

### **Implementation Commitment**

	2014		2015				2016				2017				2018				2019			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Baselines-Segment 1 Phase 1 Tower Services and Segment 1 Phase 2 En Route Initial Services										DAL DFW MCI MDW MKE MSP ORD RDU SJU STL				ADW	RNO	BUF CHS CMH RSW	VNY					
Initial Operating Capability (IOC) for Initial En Route Services at first Air Route Traffic Control Center (ARTCC)																						

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Group A (19 towers)	
Group B (15 towers)	
Group C (18 towers)	
Group D (7 towers)	

Site Name	Site ID	ARTCC ID	IOC (CY)	Status
Newark	EWR	ZNY	Q1 2016	•
J F Kennedy	JFK	ZNY	Q1 2016	•
LaGuardia	LGA	ZNY	Q1 2016	•
Teterboro	TEB	ZNY	Q1 2016	•
Westchester	HPN	ZNY	Q2 2016	•
Philadelphia	PHL	ZNY	Q2 2016	•
Boston	BOS	ZBW	Q2 2016	•
Bradley	BDL	ZBW	Q2 2016	•
Detroit	DTW	ZOB	Q2 2016	•
Cleveland	CLE	ZOB	Q3 2016	•
Pittsburgh	PIT	ZOB	Q3 2016	•
Balt/Wash	BWI	ZDC	Q3 2016	•
Dulles	IAD	ZDC	Q3 2016	•
Reagan	DCA	ZDC	Q3 2016	•
Raleigh/Durham	RDU	ZDC	Q4 2016	•
Chicago Midway	MDW	ZAU	Q4 2016	•
Chicago O'Hare	$2 { m brd}$	ZAU	Q4 2016	•
Milwaukee	MKE	ZAU	Q4 2016	•

### **Implementation Commitment** 2016 Q1 Q1 Q3 04 Q1 Q3 Q4 Q1 Q2 Q3 04 Q2 Q3 04 Q1 Q2 03 04 Q2 Q3 Q4 Q2 RNO BUF DAL ADW DFW CHS MCI СМН Baselines-Segment 1 Phase 1 Tower Services and Segment 1 Phase 2 En Route Initial Services MDW RSW MKE ORD RDU SJU STL Initial Operating Capability (IOC) for Initial En Route Services at first Air Route Traffic Control Center (ARTCC) ● Implemented On track New/Revised Delayed Dependent Removed All dates are in calendar years. **Pre-Implementation Commitment** 2014 2015 2016 2017 2019 2018 Q2 Q3 Q4 Q1 Q1 Q1 Extend Departure Clearance Operational Trials EWR MEM Final Investment Decision (FID) for En Route Services FULL SERVICES SERVICES Framework for non-VHF Digital Link (VDL) Mode 2 Q4-2016 ● Implemented ■ On track New/Revised △ Delayed New Dependent ● Removed All dates are in calendar years. **Industry Commitments** 2016 2017 2018 2019 Q3 Q1 Q1 Q2 Q3 Q4 Q1 Q3 Q4 Q1 Q2 Q3 Q4 Q2 Q3 Q4 Q4 Q1 Q2 Q3 Q4 Q2 Airlines to Equip 1,900 Aircraft Q3 2018 Assessment of Boeing 737 Flight Management Computer Issue Implementation Framework for non-VHF Digital Link (VDL) Mode 2 Q4-2016 Industry Recommendation on Recorder Rule for Retrofit ■ Implemented ■ On track New/Revised Delayed Dependent Removed All dates are in calendar years. Page last modified: September 05, 2018 8:34:37 AM EDT NextGen What is NextGen? NextGen Advisory Committee How NextGen Works **General Aviation** Working Together Where We Are Now Where We Are Headed 22 NextGen by the Numbers NextGen Near You Equip ADS-B

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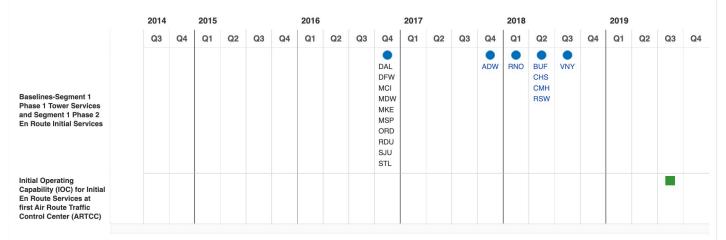
### **Schedule and Stats**

### List of capabilities and their implementation status

NOTE: The site milestones in the table below represent accelerated challenge dates which are ahead of the baseline milestones for the program.

Key Sites (3 towers)	Site Name	Site ID	ARTCC ID	IOC (CY)	Status
Group A (19 towers)	Joint Base Andrews	ADW	ZDC	Q4 2017	•
Group A (19 towers)	Reno	RNO	ZOA	Q1 2018	•
Group B (15 towers)	Columbus	СМН	ZID	Q2 2018	•
Group C (18 towers)	Fort Myers	RSW	ZMA	Q2 2018	•
Output B (Thomas)	Charleston	CHS	ZJX	Q2 2018	•
Group D (7 towers)	Buffalo	BUF	ZOB	Q2 2018	•
	Van Nuys	VNY	ZLA	Q3 2018	•

### **Implementation Commitment**



● Imple23nted ■ On track

All dates are in calendar years.

New/Revised

A Delayed Dependent

### **Pre-Implementation Commitment** 2014 2015 2016 2017 2018 2019 Q3 Q1 Q4 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 **Extend Departure** EWR Clearance Operational MEM Final Investment Decision (FID) for En INITIA FULL **Route Services** SERVICES SERVICES Implementation Framework for non-VHF Digital Link (VDL) Mode 2 Q4-2016 New/Revised Dependent Removed Implemented On track Delayed All dates are in calendar years. **Industry Commitments** 2014 2015 2016 2017 2018 2019 Q3 Q4 Q1 Q2 Q3 Q4 Airlines to Equip 1,900 Aircraft Q3 2018 Assessment of Boeing 737 Flight Management Computer Issue Implementation Framework for non-VHF Digital Link (VDL) Mode 2 Media Q4-201 Industry Recommendation on Recorder Rule for Retrofit Delayed Implemented On track New/Revised All dates are in calendar years. Page last modified: September 05, 2018 8:34:37 AM EDT **NextGen** What is NextGen? NextGen Advisory Committee How NextGen Works General Aviation Working Together Where We Are Now Where We Are Headed NextGen by the Numbers

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**NextGEN** 

### NextGen Priorities - Multiple Runway Operations

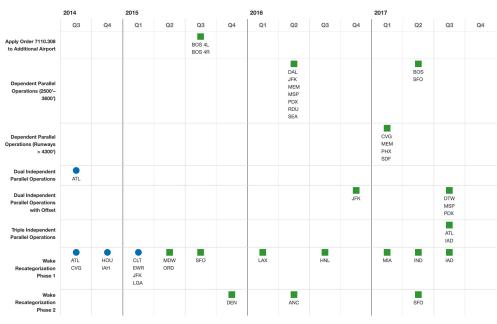
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The efficiency of parallel runways, particularly those that are closely spaced, has been limited by the interplay of wake vortices with nearby aircraft. Multiple Runway Operations (MRQ) capabilities improve access to these runways and can increase basic runway capacity and throughput by reducing separation between aircraft based on improved wake categorization standards. Improved access will enable more arrivals and/or departures during outside of visual meteorological conditions, which will increase efficiency and reduce flight delays. These commitments are a subset of the overall series of programs and activities the FAA has planned to





### Implementation Commitment





### Pre-Implementation Commitment



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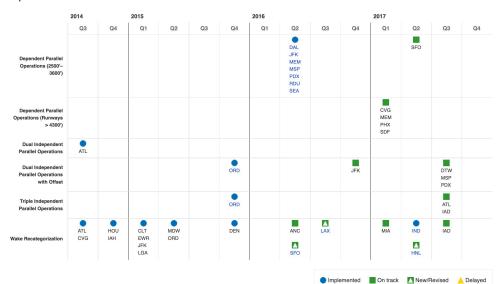


### NextGen Priorities - Multiple Runway Operations

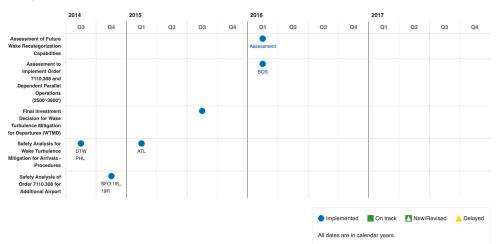
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### Implementation Commitment



### **Pre-Implementation Commitment**



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**NextGEN** 

### NextGen Priorities - Surface Operations and Data Sharing

Some of the greatest efficiencies can be gained while an aircraft is still on the ground. The FAA commits to implementing near-term surface improvements, sharing more data with stakeholders, and completing feasibility assessments of some other capabilities of interest. The goal of these enhancements is to measurably increase predictability and provide actionable and measurable surface efficiency improvements. These commitments are as usable of the overall series of programs and activities the FAA is planning to improve operations in these domains.



### Implementation Commitment



### Pre-Implementation Commitment



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### **Airports**

### Measuring the Performance of Airports

Airport performance is crucial to air traffic controllers, airports, and airlines as they plan schedules and anticipate traffic levels. Airline operators, for example, prefer to set departure and arrival times, and the flight routes of their choice. Knowing how long an aircraft must wait to depart, operators can plan for the impacts to fuel burn, emissions, and the passenger experience. The FAA measures and reports on airport performance at locations where NextGen technologies have been implemented.



### **Airport Locations**



- The Marquee Location pages, highlighted with yellow dots, contain additional information to show how implemented NextGen capabilities are impacting operations at these airports and how they relate to the National Airspace System (NAS).

### List of Airport Locations

Performance is reported based on efficiency and capacity at the FAA's Core 30 Airports. These are airports in major metropolitan areas with the highest volume of traffic. Complex, high-density operations are the breeding ground for traffic congestion and delays.

To identify areas where improvements can be made, the FAA measures an airport's daily capacity, as well as airlines' scheduled versus actual flight time performance. In addition to improvements from NextGen capabilities, a myriad of factors influence those metrics including weather, aircraft types, traffic volume, and runway conditions.

Most airport metrics in this section are available for fiscal years (FY) 2009–2016, while two of the efficiency metrics offer data for FY 2011–2016.

For more information please see the NextGen Operational Performance Assessment (PDF).

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### **Airports**

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### List of Airport Locations

Performance is reported based on efficiency and capacity at the FAA's Core 30 Airports. These are airports in major metropolitan areas with the highest volume of traffic. Complex, high-density operations are the breeding ground for traffic congestion and delays.

To identify areas where improvements can be made, the FAA measures an airport's daily capacity, as well as airlines' scheduled versus actual flight time performance. In addition to improvements from NextGen capabilities, a myriad of factors influence those metrics including weather, aircraft types, traffic volume, and runway conditions.

Most airport metrics in this section are available for fiscal years (FY) 2009-2016. while two of the efficiency metrics offer data for FY 2011-2016.

For more information please see the NextGen Operational Performance Assessment (PDF).

# Select an Airport

Airport --

ATL - Hartsfield-Jackson Atlanta International Airport

BOS - Boston - General Edward Lawrence Logan Airport

BWI - Baltimore/Washington International Thurgood Marshall Airport

**CLT - Charlotte Douglas International Airport** 

DCA - Ronald Reagan Washington National Airport

DEN - Denver International Airport

DFW - Dallas/Fort Worth International Airport

DTW - Detroit Metropolitan Wayne County Airport

EWR - Newark Liberty International Airport

FLL - Fort Lauderdale-Hollywood International Airport

HNL - Honolulu International Airport

IAD - Washington Dulles International Airport

IAH - Houston - George Bush Intercontinental Airport

JFK - New York - John F. Kennedy International Airport

LAS - Las Vegas - McCarran International Airport

LAX - Los Angeles International Airport

LGA - New York - LaGuardia Airport

MCO - Orlando International Airport

MDW - Chicago Midway International Airport

MEM - Memphis International Airport

MIA - Miami International Airport

MSP - Minneapolis-St. Paul International/Wold-Chamberlain Airport

ORD - Chicago O'Hare International Airport

PHL - Philadelphia International Airport

PHX - Phoenix Sky Harbor International Airport

SAN - San Diego International Airport

SEA - Seattle-Tacoma International Airport

SFO - San Francisco International Airport

SLC - Salt Lake City International Airport

TPA - Tampa International Airport

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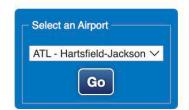


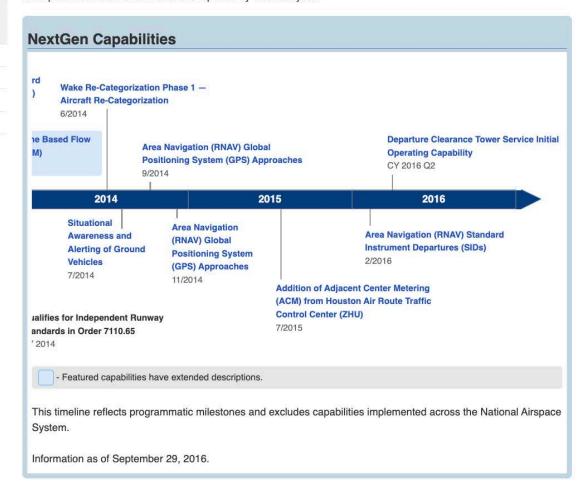
# Hartsfield-Jackson Atlanta International Airport

Hartsfield-Jackson Atlanta International Airport (ATL)

- · Busiest airport in the world.
- Passenger traffic increased 1.9 percent in 2014 to 96.2 million.
- 12th busiest airport in terms of cargo volume, with 601,269 metric tons of freight and mail passing through its facilities in 2014.
- · Primary hub for Delta Air Lines.

All airport information shown above is reported by calendar year.





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### **Equivalent Lateral Spacing Operations (ELSO)**

### ▼ What is ELSO?

Departure routes from a runway must diverge by a minimum angle to ensure safe separation between departures. Equivalent Lateral Spacing Operations (ELSO) refers to the reduction of this minimum made possible by more precise aircraft navigation, which can create opportunities to add diverging departure routes without reducing safety. Since less separation is often required for successive departures that diverge, controllers can sequence departures so as to reduce the time between takeoffs. This can increase the number of takeoffs that a runway can accommodate during busy periods, and, by extension, reduce the time that aircraft spend in line waiting to depart.



**Performance Based Navigation** 

- How is ELSO used in Atlanta?
- How did it impact operations?
- What is the value of this improvement?
- Where else is it implemented?

Additional information available on the NextGen Portfolio pages.

### Scorecard

View as Charts



The following metrics summarize performance over a large set of diverse operations at this location. As such, their purpose is to reflect general trends as experienced by aircraft operators and passengers, without regard to their underlying drivers. For this reason, metric values should not be compared to operational impacts attributed to specific NextGen capabilities, where these are provided.

All Information below is in Fiscal Years (October 1 - September 30).

Reportable Hours for ATL 07:00 - 22:59 local time

### Efficiency Capacity

Performance Indicator (FY)	2009	2010	2011	2012	2013	2014	2015	2016
Average Gate Arrival Delay Minutes per Flight	10.2	5.5	4.4	0.5	3.7	4.0	0.2	-0.6
Average Number of Level-offs per Flight Counts per Flight	4	1	2.8	2.6	2.7	2.5	2.5	2.5
Distance in Level Flight from Top of Descent to Runway Threshold Nautical Miles per Flight	1	i	36.4	34.6	35.6	34.3	34.8	32.9
Effective Gate-to-Gate Time Minutes per Flight	128.0	126.9	124.3	118.8	119.6	122.3	120.6	120.9
Taxi-In Time Minutes per Flight	11.4	11.7	11.1	10.4	9.2	9.3	8.9	8.4
Taxi-Out Time Minutes per Flight	22.2	21.8	21.0	19.5	18.5	17.8	17.6	17.1

### Consistent data for the time period prior to FY 2011 are not available.

As described by the International Civil Aviation Organization (ICAO), efficiency addresses the operational and economic cost-effectiveness of gate-to-gate flight operations from a single-flight perspective. In all phases of flight, airspace users want to 3dpart and arrive at the times they select and fly the trajectory they determine to be optimum.

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Marshall Airport

### <



Baltimore-Washington International Thurgood Marshall Airport (BWI) is the 23rd busiest airport in North America in terms of passenger traffic, which decreased 0.8 percent in 2014 to 22.3 million. The number of operations decreased 5.6 percent in 2013 to 245,121. In 2014, BWI was the 36th busiest airport in terms of cargo volume with 105,153 metric tons moving through its facilities — a decrease of 3.5 percent from the previous year. Southwest Airlines is the airport's largest carrier in average daily domestic flights.

Select an Airport

BWI - Baltimore/Washi 

Go

Several NextGen capabilities and enabling improvements have been implemented including Airport Surface Detection Equipment-Model X, External Surface Data Release, Expanded Low-Visibility Operations Using Lower Runway Visual Range Minima, Performance Based Navigation procedures, basic rerouting, Optimized Profile Descents, and an Equivalent Lateral Spacing Operation Standard.

All airport information shown above is reported by Calendar Year (CY).

### Scorecard

View as Charts

The following metrics summarize performance over a large set of diverse operations at this location. As such, their

purpose is to reflect general trends as experienced by aircraft operators and passengers, without regard to their underlying drivers. For this reason, metric values should <u>not</u> be compared to operational impacts attributed to specific NextGen capabilities, where these are provided.

All Information below is in Fiscal Years (October 1 - September 30).

Reportable Hours for BWI 06:00 - 22:59 local time

Efficiency

Capacity

Performance Indicator (FY)	2009	2010	2011	2012	2013	2014	2015	2016
Average Gate Arrival Delay Minutes per Flight	2.8	3.1	4.2	0.6	4.1	5.6	2.1	1.0
Average Number of Level-offs per Flight Counts per Flight	ğ	1	3.7	3.6	3.7	3.8	3.6	3.2
Distance in Level Flight from Top of Descent to Runway Threshold Nautical Miles per Flight	1	1	49.0	47.9	49.1	49.5	47.1	44.3
Effective Gate-to-Gate Time Minutes per Flight	120.3	121.8	123.3	118.6	121.9	126.2	129.0	130.5
Taxi-In Time Minutes per Flight	5.5	5.9	5.8	5.7	6.2	5.9	6.7	6.5
Taxi-Out Time Minutes per Flight	13.0	13.1	13.0	12.7	13.7	13.5	14.2	13.9

### <sup>1</sup> Consistent data for the time period prior to FY 2011 are not available.

As described by the International Civil Aviation Organization (ICAO), efficiency addresses the operational and economic cost-effectiveness of gate-to-gate flight operations from a single-flight perspective. In all phases of flight, airspace users want to depart and arrive at the times they select and fly the trajectory they determine to be optimum.



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# **VextGEN**

# Orlando International Airport

Orlando International Airport (MCO) experienced a 2.7 percent increase in passengers in 2014 to reach 35.7 million. The number of operations decreased 0.5 percent from 2013 to 290,331. In 2014, 172,869 metric tons of cargo passed through MCO's facilities, an increase of 1.3 percent from the previous year. Southwest Airlines is the airport's largest carrier of passengers.

Several NextGen capabilities and enabling improvements have been implemented including Airport Surface Detection Equipment-Model X, External Surface Data Release, Performance Based Navigation procedures, basic rerouting, an Equivalent Lateral Spacing Operation Standard, Adapted for Time Based Flow Management use, and Expanded Low-Visibility Operations Using Lower Runway Visual Range Minima.

Select an Airport MCO - Orlando Interna V Go

View as Charts

All airport information shown above is reported by Calendar Year (CY).

### Scorecard

The following metrics summarize performance over a large set of diverse operations at this location. As such, their purpose is to reflect general trends as experienced by aircraft operators and passengers, without regard to their underlying drivers. For this reason, metric values should not be compared to operational impacts attributed to specific NextGen capabilities, where these are provided.

All Information below is in Fiscal Years (October 1 - September 30).

Reportable Hours for MCO 07:00 - 21:59 local time

Efficiency

Capacity

Performance Indicator (FY)	2009	2010	2011	2012	2013	2014	2015	2016
Average Gate Arrival Delay Minutes per Flight	1.9	1.5	2.6	0.5	2.8	5.8	3.8	2.9
Average Number of Level-offs per Flight Counts per Flight	1	1	2.7	2.7	2.8	2.8	2.8	2.7
Distance in Level Flight from Top of Descent to Runway Threshold Nautical Miles per Flight	15	1.	38.6	38.7	39.7	39.9	39.7	37.1
Effective Gate-to-Gate Time Minutes per Flight	150.9	150.7	150.4	149.0	154.6	159.1	160.0	159.6
Taxi-In Time <i>Minutes per Flight</i>	7.0	7.6	7.7	7.6	7.8	7.7	8.2	8.9
Taxi-Out Time Minutes per Flight	13.1	13.3	13.6	13.5	13.9	14.2	14.6	14.9

### Consistent data for the time period prior to FY 2011 are not available.

As described by the International Civil Aviation Organization (ICAO), efficiency addresses the operational and economic cost-effectiveness of gate-to-gate flight operations from a single-flight perspective. In all phases of flight, airspace users want to depart and arrive at the times they select and fly the trajectory they determine to be optimum.