NextGen Hartsfield-Jackson Atlanta International Airport

Hartsfield-Jackson Atlanta International Airport (ATL) has been the busiest airport in the world in passenger traffic for many years. Passenger traffic increased 1.9 percent in 2014 to 96.2 million. There were 868,359 operations in ATL, a decrease of 4.7 percent compared with 2013. In 2014, ATL was the 12th busiest airport in terms of cargo volume, with 601,269 metric tons passing through its facilities, which is a decrease of 2.4 percent from 2013. ATL airport is the primary hub for Delta Air Lines.

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

NextGen Capabilities

Airport Surface Detection Equipment — Model X (ASDE-X)
6/2006
Area Navigation (RNAV) Global Positioning System (GPS) Approaches
6/2006
Area Navigation (RNAV) Standard Instrument Departures (SIDs)
5/2009
Required Navigation Performance (RNP) Authorization Required (AR) Approaches
5/2009
Adapted for Adjacent Center Metering (ACM)
6/2009
Area Navigation (RNAV) Standard Terminal Arrival Routes (STARs)
2/2010
Area Navigation (RNAV) Standard Terminal Arrival Routes (STARs)
7/2010
External Surface Data Release
FY 2011
Expanded Low-Visibility Operations Using Lower Runway Visual Range (RVR) Minima
5/2011
Area Navigation (RNAV) Standard Terminal Arrival Routes (STARs)
8/2011
Optimized Profile Descents (OPDs)
8/2011
Equivalent Lateral Spacing Operations (ELSO)
10/2011
Automated Terminal Proximity Alert (ATPA) Phase 1
5/2012
Expanded Low-Visibility Operations Using Lower RVR Minima
11/2012
Area Navigation (RNAV) Standard Terminal Arrival Routes (STARs)
5/2013
Optimized Profile Descents (OPDs)
5/2013
Expanded Low-Visibility Operations Using Lower RVR Minima
5/2013
Deployment of Time Based Flow Management (TBFM)
by 8/2013
Wake Re-Categorization Phase 1 — Aircraft Re-Categorization
6/2014
Situational Awareness and Alerting of Ground Vehicles
7/2014
Area Navigation (RNAV) Global Positioning System (GPS) Approaches

9/2014
Area Navigation (RNAV) Global Positioning System (GPS) Approaches
11/2014
Addition of Adjacent Center Metering (ACM) from Houston Air Route Traffic Control Center (ZHU)
7/2015
Qualifies for Independent Runway Standards in Order 7110.65
FY 2014
Departure Clearance Tower Service Initial Operating Capability
CY 2016 Q2
Area Navigation (RNAV) Standard Instrument Departures (SIDs)
2/2016
- Featured capabilities have extended descriptions.

This timeline reflects programmatic milestones, and excludes capabilities implemented across the National Airspace System.

Information as of September 29, 2016.

Airport Surface Detection Equipment — Model X (ASDE-X)

Learn more about surface surveillance capabilities in the 2016 NextGen Update.

Read how ASDE-X is used at other locations in the National Airspace System.

Area Navigation (RNAV) Global Positioning System (GPS) Approaches

Read how RNAV GPS Approaches and other NextGen technology are used at other locations in the National Airspace System.

Area Navigation (RNAV) Standard Instrument Departures (SIDs)

View a training video for using the RNAV SID phraseology.

Required Navigation Performance (RNP) Authorization Required (AR) Approaches

Read how RNP AR Approaches are used at other locations in the National Airspace System.

Adapted for Adjacent Center Metering (ACM)

Read how ACM is used at other locations in the National Airspace System.

Area Navigation (RNAV) Standard Terminal Arrival Routes (STARs)

Read about Performance Based Navigation and RNAV in the 2016 NextGen Update.

Area Navigation (RNAV) Standard Terminal Arrival Routes (STARs)

Read about Performance Based Navigation and RNAV in the 2016 NextGen Update.

External Surface Data Release

Read how surface data sharing is used at other locations in the National Airspace System.

Expanded Low-Visibility Operations Using Lower Runway Visual Range (RVR) Minima

Read how expanded low visibility operations have impacted the National Airspace System.

Area Navigation (RNAV) Standard Terminal Arrival Routes (STARs)

Read about Performance Based Navigation and RNAV in the 2016 NextGen Update.

Optimized Profile Descents (OPDs)

Learn more about Optimized Profile Descents (OPDs) in the 2016 NextGen Update.

Read how Optimized Profile Descents (OPDs) are helping aircraft operators throughout the National Airspace System.

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?

On October 20, 2011, two new departure routes enabled by Equivalent Lateral Spacing Operations (ELSO) were implemented at Hartsfield-Jackson Atlanta International Airport (ATL) through a waiver of the national standard—one each for use during the airport's east and west-flow configurations. The revised departure route structure allows Atlanta controllers to segregate departure flows more efficiently from the three departure runways used in each configuration. Controllers can line-up departures from runways 08R (in east operation) and 27R (west) in order to take advantage of the less restrictive separation standards, which could be applied to roughly 25 percent of departures at ATL at the time of implementation. For affected flights taking off from these runways, this means less time waiting for a departure clearance when positioned for takeoff. This allows ATL controllers to process flights at a faster rate, thereby increasing the airport's capacity.

How did it impact operations?

The addition of Equivalent Lateral Spacing Operations (ELSO) enabled routes had a significant positive impact on departure operations at Hartsfield-Jackson Atlanta International Airport (ATL). Following implementation, the FAA observed:

- A reduction in the time between departures on the two affected runways, from 62 to 46 seconds, as measured by the most typical value. This translates to an increase in departure throughput.
- A resulting increase in ATL's departure capacity as set by the facility, from 101 to 105 departures per hour.

A reduced reliance on the third, and most distant, departure runway, from 3.1 percent to 1.2 percent of all departures. Affected flights saved about six minutes taxiing for departure.

The increased departure rate and reduced reliance on the most distant departure runway translated to an average saving of 2.5 minutes taxiing out per flight, based on an FAA analysis of ATL taxi out times using FAA's Aviation System Performance Metrics (ASPM) data.

Click here for a full description of the NextGen Operational Performance Assessment.

What is the value of this improvement?

The FAA estimates that the reduction in taxi-out time for Hartsfield-Jackson Atlanta International Airport (ATL) departures translated to about $90 million in cost savings to aircraft operators between 2012 and 2014 (expressed in 2015 dollars). In terms of the benefit to passengers, these time reductions were valued at nearly $250 million over the same period. These estimates are based on aircraft operating cost and passenger load factors that reflect ATL's traffic mix.

Where else is it implemented?

As of this publication date, Equivalent Lateral Spacing Operations (ELSO) has not been implemented at other locations. However, in June 2015 the FAA reduced the pre-existing divergence standard that applied to the National Airspace System, making ELSO available for consideration at additional sites.

Additional information available on the NextGen Portfolio pages.

Automated Terminal Proximity Alert (ATPA) Phase 1

Read how ATPA can help operations across the National Airspace System.

Expanded Low-Visibility Operations Using Lower RVR Minima

Read how expanded low visibility operations have impacted the National Airspace System.

Area Navigation (RNAV) Standard Terminal Arrival Routes (STARs)

Read about Performance Based Navigation and RNAV in the 2016 NextGen Update.

Optimized Profile Descents (OPDs)

Learn more about Optimized Profile Descents (OPDs) in the 2016 NextGen Update.

Read how Optimized Profile Descents (OPDs) are helping aircraft operators throughout the National Airspace System.

Expanded Low-Visibility Operations Using Lower RVR Minima

Read how expanded low visibility operations have impacted the National Airspace System.

Deployment of Time Based Flow Management (TBFM)

What is Time Based Flow Management?

Time Based Flow Management (TBFM) is a capability used to manage traffic flows by metering, or

sequencing aircraft to their arrival airport. Through TBFM, an automation system uses a schedule of runway assignments and landing times to sequence inbound flights, and allocates delays to various segments of each flight in order to meet the assigned schedule. TBFM is administered by traffic managers at the Air Route Traffic Control Center (ARTCC) or Terminal Radar Approach Control (TRACON) of the arrival airport. For some airports, TBFM is used routinely, while at others it is used as needed.

TBFM provides four time-based metering functions:

Arrival management/situational awareness to inform traffic managers of projected arrival demand
Airborne metering to sequence flights and provide controllers with allocated delay assignments for each flight to meet the proposed schedule
Departure scheduling to provide increased management of arrival demand by assigning delays to flights at their origin airports
En route departure capability (EDC) to efficiently integrate departures into overhead en route streams

TBFM enables the more efficient use of available capacity by tailoring the allocation of delays to individual flights, thereby reducing the need for less efficient "one-size-fits-all" techniques such as Miles-in-Trail (MIT) restrictions. In turn, this can reduce total aircraft delays, and transfer delays to more fuel-efficient phases of flight, such as on the ground or at higher altitudes. Importantly, the transfer of delays out of the terminal approach area positions inbound flights to take advantage of Optimized Profile Descent (OPD) procedures, where these have been implemented. The use of TBFM varies significantly by location, reflecting differences in operating environments and air traffic management strategies.

A predecessor of TBFM called Traffic Management Advisor (TMA) was developed and implemented in the 1990s. TMA was deployed at all 20 ARTCCs by 2007, and was modernized as TBFM in 2013 as a result of a major system re-architecture.

 Time Based Flow Management

How is TBFM used for Atlanta?

At Hartsfield-Jackson Atlanta International Airport (ATL), airborne metering and departure scheduling are routinely used to manage arrivals. Until recently, Time Based Flow Management (TBFM) was used to meter arrivals to Atlanta Air Route Traffic Control Center (ARTCC) (ZTL), after which these flights were managed with distance-based, miles-in-trail restrictions. This combination of airborne metering to the ARTCC boundary and Miles-in-Trail (MIT) restrictions to the airport was unique among facilities that use TBFM. Since August 2015, however, ZTL has been metering arrivals within its boundaries due to enhancements to TBFM software, and in preparation for the Atlanta Metroplex implementation in 2016.

The use of time-based metering with TMA at ATL predates the NextGen program. However, the deployment of the modernized TBFM system in 2013 provided technical enhancements and a platform for additional operational benefits at ATL and other airports.

How did it impact operations?

The FAA conducted an operational assessment of two Time Based Flow Management (TBFM) functions, airborne metering and departure scheduling, at eight airports (four per function) where these are used widely, including Hartsfield-Jackson Atlanta International Airport, due to its routine use of airborne metering. The locations were selected based on how frequently each function is used alone and in combination, so the impact of each function could be measured. For this reason,

results cannot be interpreted to be representative of impacts at other locations.

For each function, the assessment looked at the impact on both arrival delays and airborne delays as indicators of how efficiently available capacity was used. The FAA's assessment of flights between July 2011 and December 2013 found that:

For three of four airports studied that use Departure Scheduling, arrivals tended to experience 1.0 to 1.3 minutes less of arrival delay when the facility was using TBFM to schedule departures
With few exceptions, departure scheduling also significantly reduced the variability of delays
There is an 8 to 10-minute difference between the average arrival delay for metered flights and those subject to Miles-in-Trail (MIT) restrictions alone, for the four airports studied. It is unclear, however, how much of this difference can be attributed exclusively to TBFM because much of the difference occurs on the ground, beyond the immediate scope of TBFM's influence
Metered flights also experienced about a minute less airborne delay than those subject to MIT restrictions, as well as less extreme and more predictable airborne delays

Click here for a full description of the NextGen Operational Performance Assessment.

What is the value of this improvement?

The FAA estimates that the combined reductions in aircraft delays for the eight airports evaluated translated to about $640 million in savings between 2011 and 2014 (expressed in 2015 dollars). These savings reflect reduced operating costs to airlines of $209 million, and time-savings to passengers valued at over $430 million. The estimate applies the average observed per-flight delay savings to the base of arrivals managed by airborne metering or departure scheduling, in accordance with the FAA's performance assessment.

Where else is it implemented?

Time Based Flow Management (TBFM) is deployed at 93 facilities across the National Airspace System (NAS), including 20 en route, 28 terminal and 45 tower facilities. It is deployed at all but two of the Core 30 airports, with Tampa International Airport (TPA) and Honolulu International Airport (HNL) as the two exceptions.

Read how Time Based Flow Management (TBFM) is used at other locations in the National Airspace System.

Additional information available on the NextGen Portfolio pages.

Wake Re-Categorization Phase 1 — Aircraft Re-Categorization

See page two of the NextGen Priorities Joint Implementation Plan- Revision I for additional information about Wake Recategorization Implementation in the National Airspace System.

Read how Wake Recategorization is used at another location in the National Airspace System.

Situational Awareness and Alerting of Ground Vehicles

Read more about System Wide Information Management (SWIM).

Area Navigation (RNAV) Global Positioning System (GPS) Approaches

Read how RNAV GPS Approaches and other NextGen technology are used at other locations in the National Airspace System.

Area Navigation (RNAV) Global Positioning System (GPS) Approaches

Read how RNAV GPS Approaches and other NextGen technology are used at other locations in the National Airspace System.

Addition of Adjacent Center Metering (ACM) from Houston Air Route Traffic Control Center (ZHU)

Read how ACM is used at other locations in the National Airspace System.

Qualifies for Independent Runway Standards in Order 7110.65

Read about Closely Spaced Parallel Operations in the 2016 NextGen Update.

Departure Clearance Tower Service Initial Operating Capability

Read more about Data Comm in the 2016 NextGen Update.

Area Navigation (RNAV) Standard Instrument Departures (SIDs)

View a training video for using the RNAV SID phraseology.

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.

Reportable Hours for ATL
07:00 - 22:59 local time
All Information below is in Fiscal Years (October 1 - September 30).

Efficiency
Capacity

Efficiency Performance Indicators

Performance Indicator (FY)	2009	2010	2011	2012	2013	2014	2015
Average Gate Arrival Delay *Minutes per Flight* **During reportable hours, the yearly average of the difference between the Actual Gate-In Time and the Scheduled Gate-In Time for flights to the selected airport from any of the ASPM airports. The delay for each fiscal year (FY) is calculated based on the 0.5th — 99.5th percentile of the distributions for the year. Flights may depart outside reportable hours, but must arrive during them. The reportable hours vary by airport.**	9.5	4.8	3.7	0.1	3.1	3.4	-0.5
Average Number of Level-offs per Flight *Counts per Flight* **The count of level-offs as flights descend from cruise altitudes to the arrival airport, averaged for the fiscal year.**	[1]	[1]	2.6	2.5	2.6	2.4	2.4

Distance in Level Flight from Top of Descent to Runway Threshold *Nautical Miles per Flight* **The distance flown during level-off segments as flights descend from cruise altitudes to the arrival airport, averaged for the fiscal year (FY).**	[1]	[1]	38.7	37.5	38.8	37.2	37.3
Effective Gate-to-Gate Time *Minutes per Flight* **During reportable hours, the difference between the Actual Gate-In Time at the destination (selected) airport and the Scheduled Gate-Out Time at the origin airport. Flights may depart outside reportable hours, but must arrive during them. The reportable hours vary by airport and the results are reported by fiscal year (FY).**	128.0	126.9	124.3	118.8	119.6	122.3	120.6
Taxi-In Time *Minutes per Flight* **During reportable hours, the yearly average of the difference between Wheels-On Time and Gate-In Time for flights arriving at the selected airport from any of the Aviation System Performance Metrics (ASPM) airports. Flights may depart outside reportable hours, but must arrive during them. The reportable hours vary by airport.**	11.4	11.7	11.1	10.4	9.2	9.3	8.9
Taxi-Out Time *Minutes per Flight* **During reportable hours, the yearly average of the difference between Gate-Out Time and Wheels-Off Time for flights from the selected airport to any of the ASPM airports. Flights must depart during reportable hours, but may arrive outside them. The reportable hours vary by airport.**	22.2	21.8	21.0	19.5	18.5	17.8	17.6

[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 depart and arrive at the times they select and fly the trajectory they determine to be optimum.*

Capacity Performance Indicator

Performance Indicator (FY)	2009	2010	2011	2012	2013	2014	2015
Average Daily Capacity *Number of Operations* **During reportable hours, the average daily sum of the Airport Departure Rate (ADR) and Airport Arrival Rate (AAR) reported by fiscal year (FY). The reportable hours vary by airport.**	3,312	3,349	3,381	3,471	3,512	3,500	3,648
Average Hourly Capacity During Instrument Meteorological Conditions (IMC) *Number of Operations* **The average hourly capacity reported during IMC weather conditions (as defined by ASPM). Capacity is defined as the sum of Airport Departure Rate (ADR) and Airport Arrival Rate (AAR). It is calculated based on the reportable hours at the destination airport. The reportable hours vary by airport.**	188	187	189	200	202	200	204

As described by the International Civil Aviation Organization (ICAO): *The global Air Traffic Management (ATM) system should exploit the inherent capacity to meet airspace user demands at peak times and locations while minimizing restrictions on traffic flow. ICAO also notes: The ATM system must be resilient to service disruption and the resulting temporary loss of capacity.*

Additional Links

NextGen Implementation Plan

View City Pairs Data