JITI Aviation Seminar

Global Harmonization of the New Air Navigation system

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Delivering NextGen: Key Definition

What is NextGen:

- **Who** – Aviation community working together
- **What** – Modernization of technologies, policies and procedures in the national airspace system
- **Why** – Increase capacity, reduce delays and cancellations, reduce our environmental footprint, enhance safety, and make bad weather performance equal to good weather performance
- **How** – Use modern aircraft ability to fly very precise routes and times, and report where they are in order to manage where they will be

FAA Air Traffic Management Transformations Underway

Past Practices

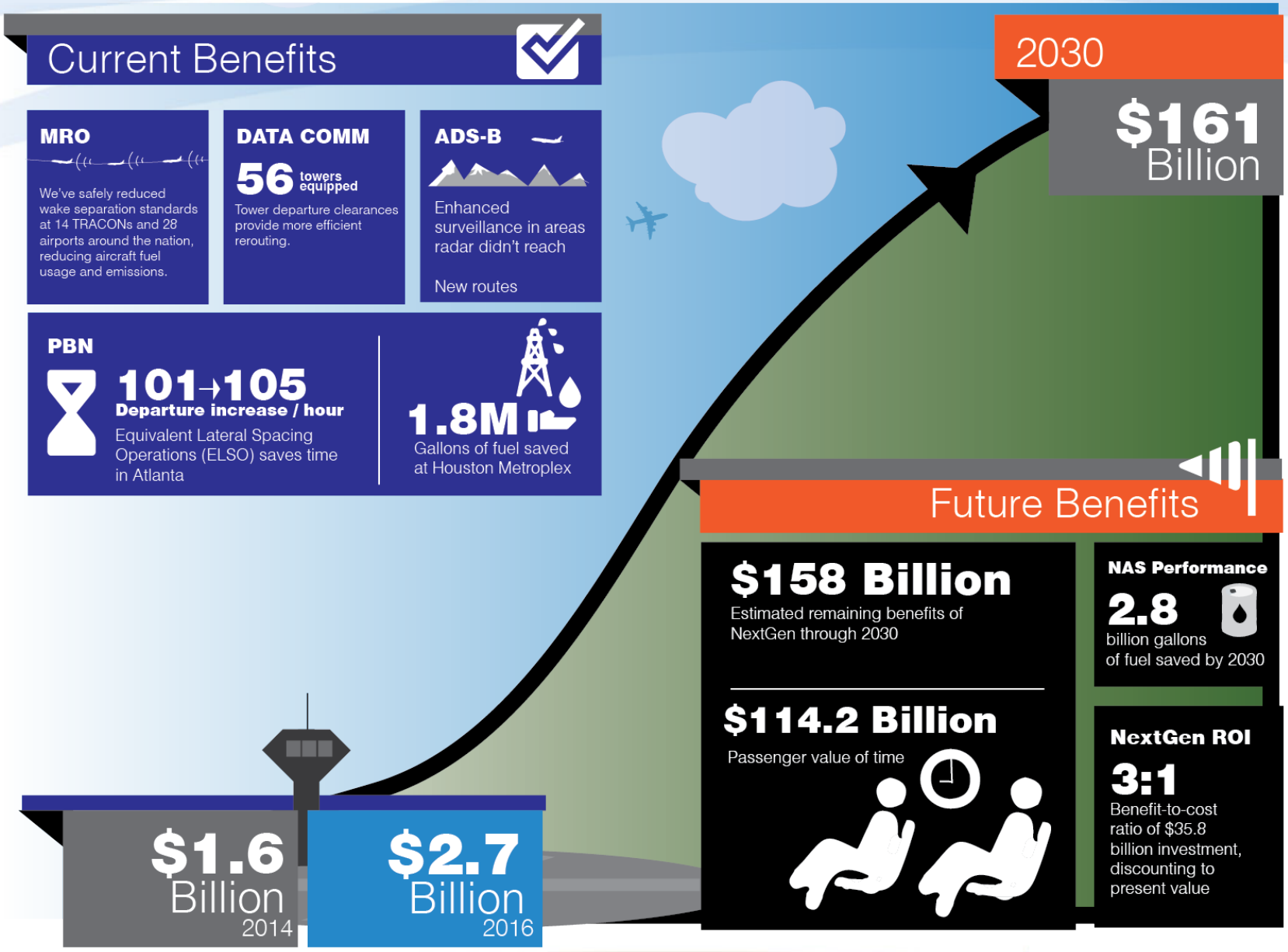
- ***Aircraft Routes:*** Routing limited by ground-based navigational infrastructure
- ***Aircraft Location:*** Future time and position of the aircraft not known by all parties*
- ***Information***: Controllers and operators do not have same information to inform decisions
- ***Communications:*** Controllers communicate by voice to each individual aircraft
- ***NAS Efficiency and Traffic Flow:*** Operational choke points across phases of flight
- ***Operations:*** Tactical and reactive air traffic control

NextGen Improvements

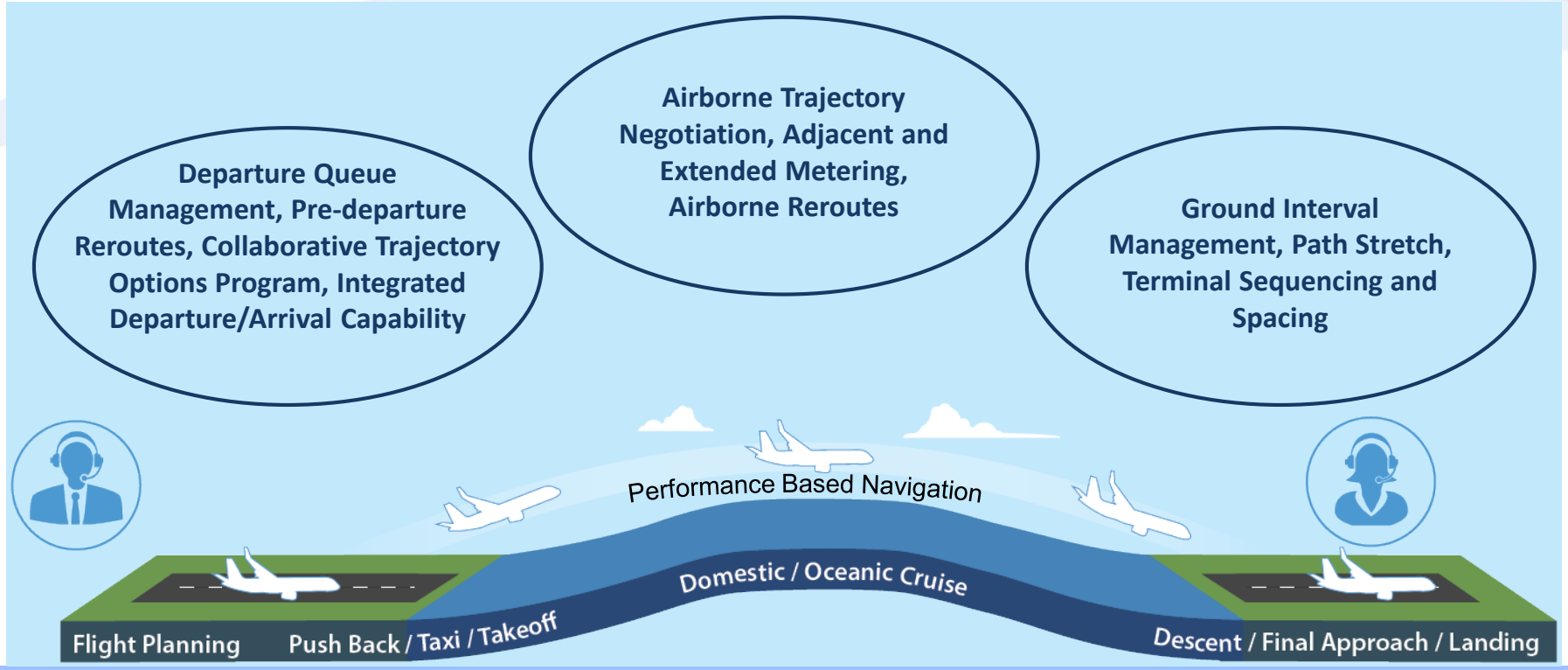
- ***Aircraft Routes:*** More efficient flight routes and aircraft performance based procedures using GPS navigation
- ***Aircraft Location:*** Future intended time and position of aircraft known for optimal flight and traffic flow
- ***Information***: Shared information (e.g., weather, traffic, system status) for collaborative decision-making
- ***Communications:*** Controllers communicate via digital messages to multiple aircraft at a time
- ***NAS Efficiency and Traffic Flow:*** Operations integrated across phases of flight for gate-to-gate efficiency
- ***Operations:*** Strategic air traffic management

*Operators, aircrews, pilots, dispatchers, controllers, operations centers and traffic managers

NextGen Benefits



Delivering NextGen Improvements



Communication, Navigation, Surveillance, Information Sharing, Weather

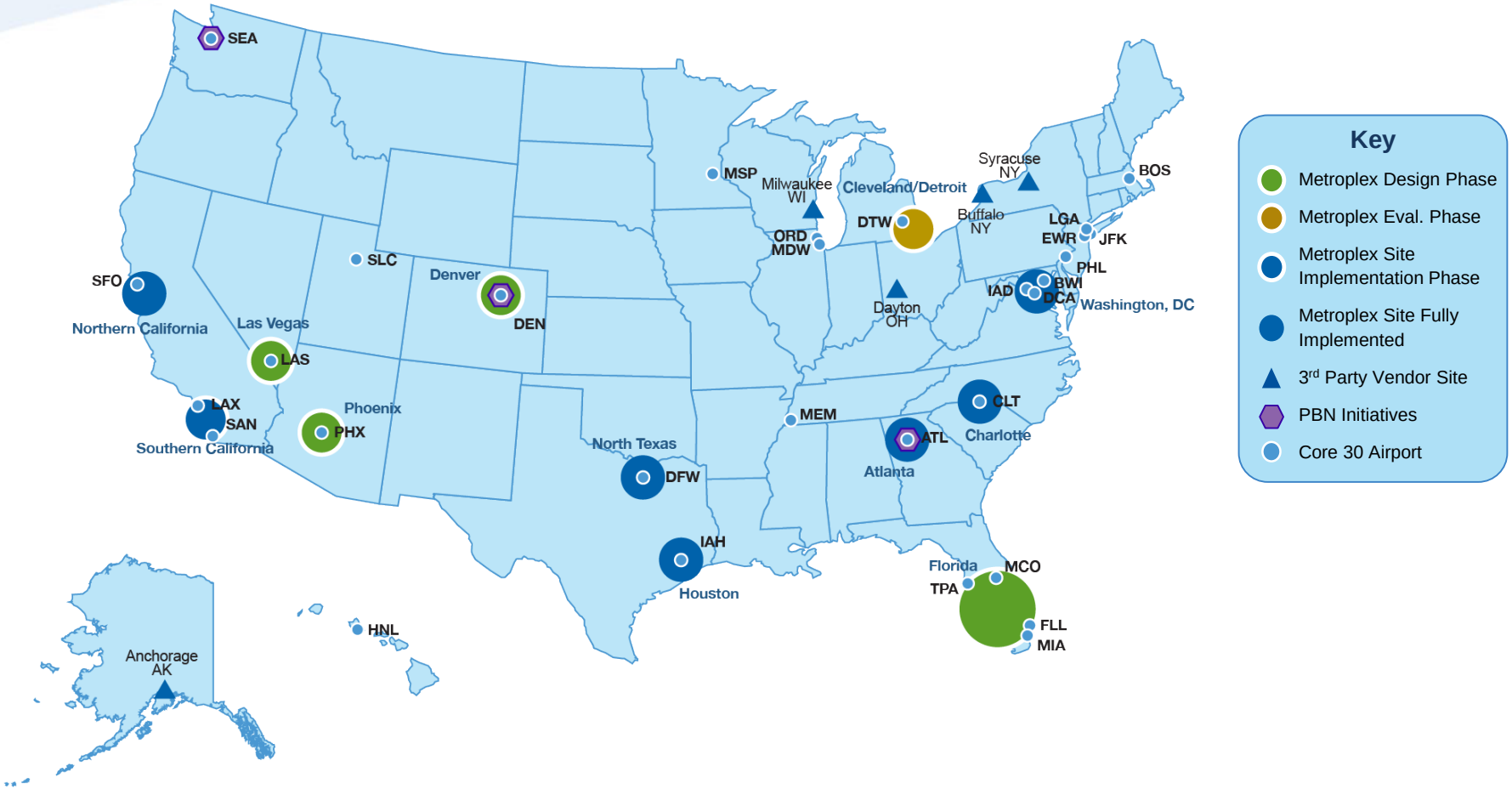
National Airspace System (NAS) Voice System (NVS), Data Communications (Data Comm), Automatic Dependent Surveillance-Broadcast (ADS-B), System Wide Information Management (SWIM), Common Support Services-Weather (CSS-Wx), NextGen Weather Processor (NWP)

Foundational Infrastructure

Terminal Flight Data Manager (TFDM)*, Time Based Flow Management (TBFM) Traffic Flow Management System (TFMS), Terminal Automation Modernization and Replacement (TAMR), En Route Automation Modernization (ERAM)

* TFDM is the only foundational infrastructure program fully funded by NextGen

Delivering NextGen: Collaborative Opportunities and Commitments
Performance Based Navigation
FY17 Key Milestones



Houston Complete 2014	North Texas Complete 2014	Northern CA Complete 2015	Washington DC Complete 2015	Atlanta Post Implementation 2017	Southern CA Post Implementation 2017	Denver Implementation Start 2017	Las Vegas Environmental 2017

Path to Trajectory Based Operations (TBO)

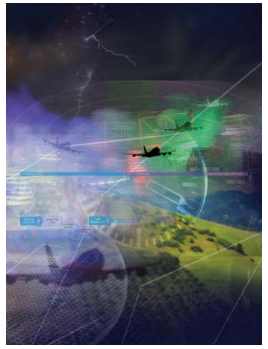
Managing aircraft based on where they will be at "critical points in time"

Trajectory Based Operations is an air traffic management (ATM) concept to operate the NAS based on the aircraft's ability to fly precise paths in time/space, and air navigation service provider's ability to strategically manage and optimize trajectories throughout the operation.

Two Key Elements of TBO:

1. Time-Based Management
2. Performance Based Navigation

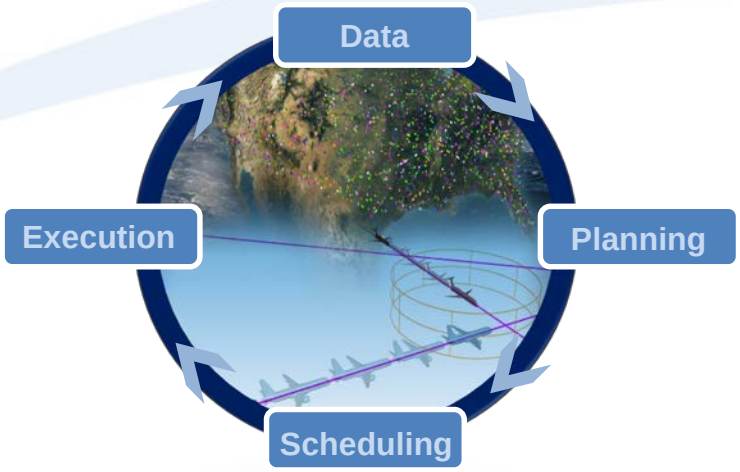
TBO Objectives:



- Improved flight efficiency
- Efficient use of capacity
- Improved schedule predictability
- Increased operational flexibility
- Increased ability to exchange trajectories with the users

Path to Trajectory Based Operations

Managing aircraft based on where they will be at "critical points in time"



2020

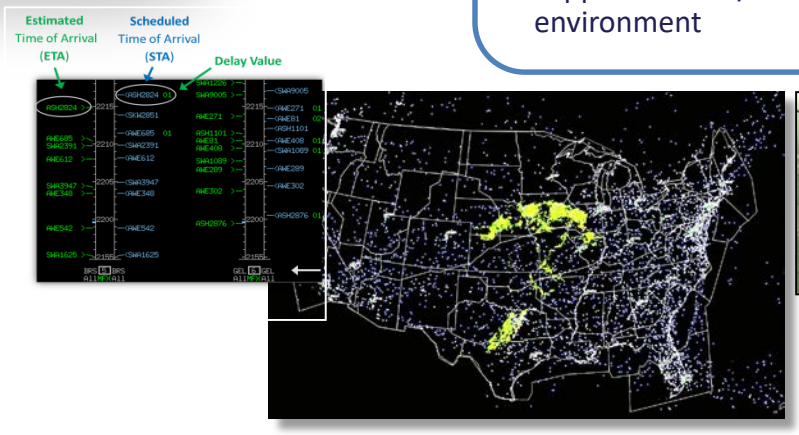
Arrival TBO

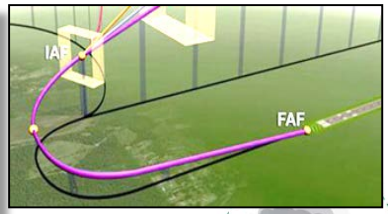
- ADS-B Out mandate
- Performance Based Navigation at nine metroplex sites
- New tower automation
- Initial Data Comm (tower and en route)
- New voice communications
- Improved weather information
- New automated tool to support surface/terminal environment

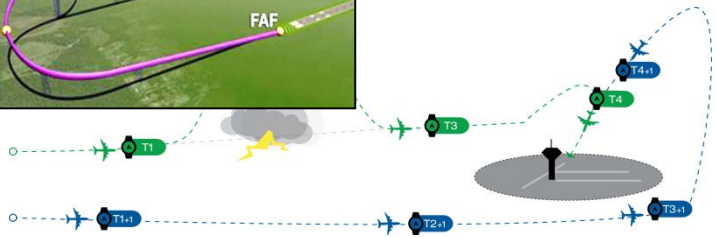
2025

Gate to Gate TBO

- Improved voice communication across the NAS
- ADS-B In
- Data Comm full capability
- Aircraft equipage alignment with new standards
- New automated tools (all phases of flight)

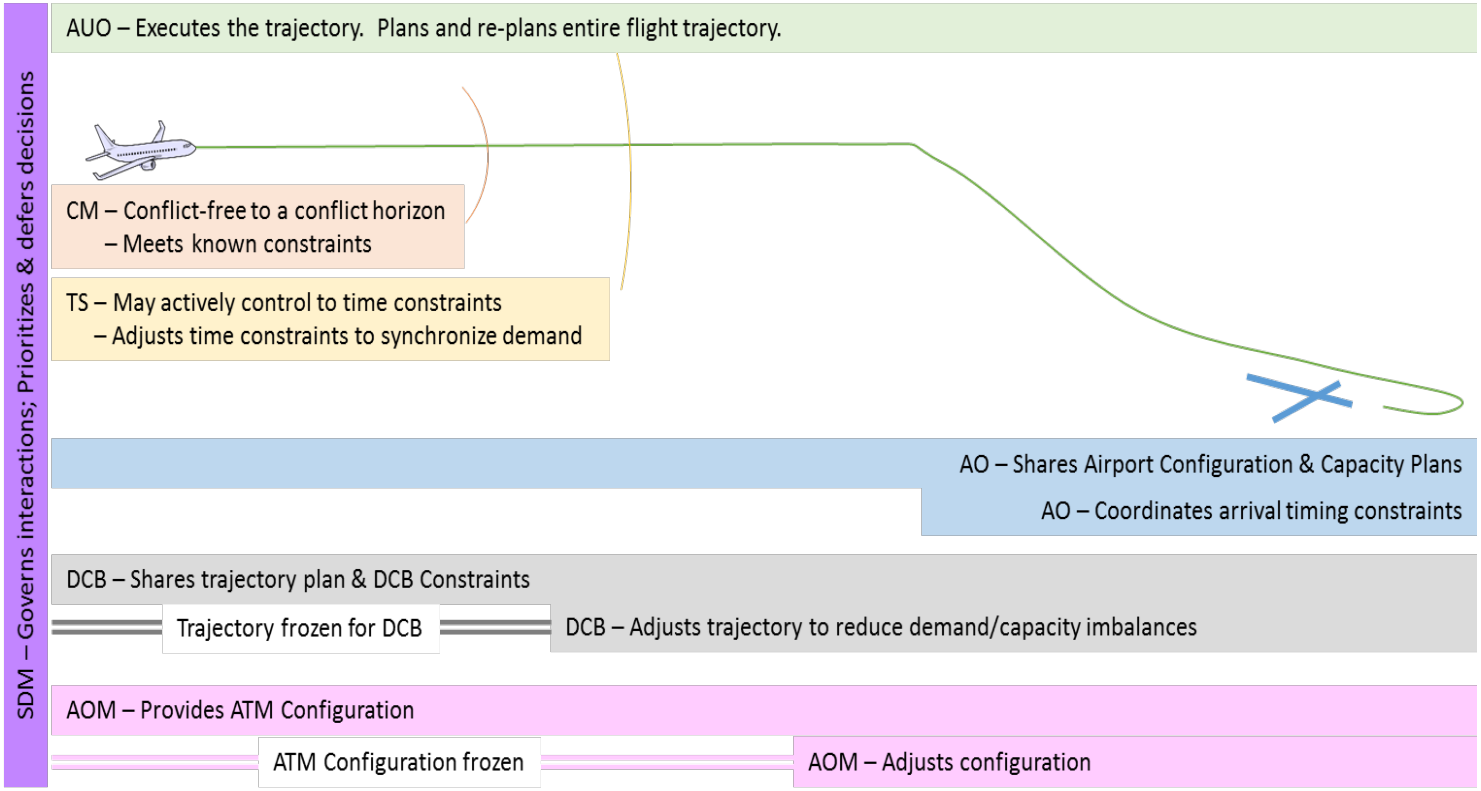






All elements of the system continuously working together to improve flight efficiency, efficient use of capacity, improve schedule predictability, increase operational flexibility, and increase ability to exchange trajectories with the users.

ICAO - Trajectory Based Operations



FAA

NextGEN

Accomplishments Overview

Infrastructure

- En Route Automation Modernization
- Automatic Dependent Surveillance–Broadcast
- Data Communications Tower Services
- System Wide Information Management
- Surface Operations and Data Sharing
- Terminal Flight Data Manager
- Time Based Flow Management

People

- Customer-Focused Air Traffic Management
- Community Outreach
- Controller and Pilot Training — New Technology, Airspace, and Procedures

Equipage

- Automatic Dependent Surveillance–Broadcast
- Data Communications
- Performance Based Navigation

Policy, Processes and Procedures

Optimizing Airspace:

- Performance Based Navigation
- Time Based Flow Management
- Traffic Flow Management System
- Separation Management

Collaborative Progress:

- RTCA Task Force 5
- NextGen Advisory Committee (NAC)
- NAC Priorities Joint Implementation Plan
- Airspace Technology Demonstrations
- SESAR Harmonization
- Mini Global Demonstrations
- Equip 2020
- PBN NAS Navigation Strategy

Safety and Environment:

- Aviation Safety Information Analysis & Sharing
- Engine, Aircraft Technologies
- Environmental Design Tool

NextGen Planned Priorities
New Rolling Plan 2017-2019

http://www.faa.gov/nextgen/media/NG_Priorities_Joint_Implementation_Plan.pdf

Data Communications

- Complete deployment of tower services
- En route initial services first site IOC
- Framework for non-VDL (VHF Digital Link) (Mode 2 In en route)
- Industry equipage (1,900 aircraft)

Multiple Runway Operations

- Wake Recategorization at 9 more sites
- Amend national standards for Vertical Navigation (VNAV) for simultaneous independent parallel approaches
- Research on time-based wake mitigation

Performance Based Navigation

- Established on RNP
- Optimized Profile Descents
- Advanced procedures
- Implementing Time Based Flow Management (TBFM)
- Metroplex (ATL, CLT, LAS)

Surface

- Implementing departure management demonstration at Charlotte
- Data sharing via System Wide Information Management (SWIM)
- Industry providing new data to FAA
- Individual airports committing to data sharing
- Initiate deployment of Terminal Flight Data Manager (TFDM)

Keys to NextGen Success