



Trajectory Based Operations Mobilizing Facilities and Implementing Change

Trajectory Based Operations (TBO)

is an air traffic management method that...

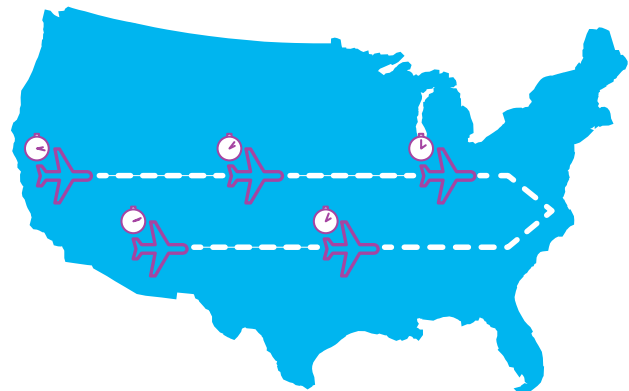
- Plans
 - Manages
- flights through the NAS



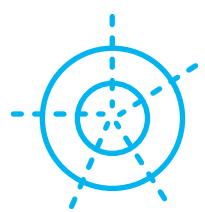
TBO delivers tighter adherence to precise flight trajectories and meters traffic flows using time instead of distance

The Best Path Forward...

TBO has moved from planning to implementation and integration in the NAS. It is being implemented incrementally and is already demonstrating benefits.

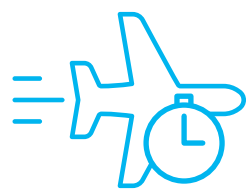
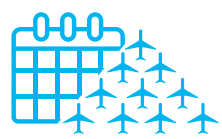


TBO Benefit



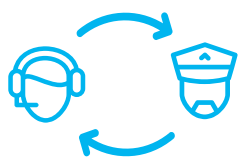
Increased throughput with more precise trajectories and better decision support tools

Increased predictability with advanced planning, and time-based management



Improved Flight Efficiency due to delay redistribution, reduced departure wait times, more effective route management, and smooth descent profiles

Increased Operator Flexibility through enhanced collaboration



...Together

As the primary users of TBO, traffic management personnel, controllers, and pilots have been crucial to the development of technology and implementation strategy. Their participation continues to help design a robust tool set that will enable the execution of the TBO vision.



TBO PROVIDES THE RIGHT TOOL AT THE RIGHT TIME

What is the Scope of TBO?

TBO is a collection of systems, capabilities, processes, and people working together to achieve operational objectives



Time-Based Management (TBM)

Manages Trajectories by Scheduling and Metering Aircraft through Constraint Points



Performance Based Navigation (PBN)

Enables Aircraft to Accurately Navigate along their Trajectories



Enterprise Enablers

Expands and Automates Sharing of Common Information about Aircraft Trajectories

Key TBO Implementation Milestones

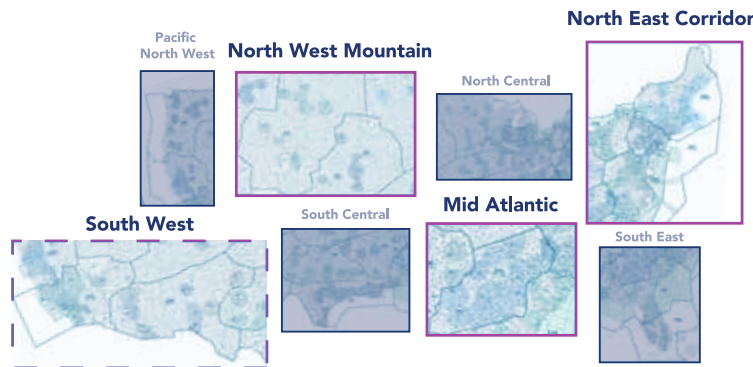
North West Mountain

- ✓ DEN Metroplex
- ✓ Extended Metering to DEN
 - ✓ Infrastructure
 - ✓ Dep Scheduling
 - ✓ Arrival Metering
- Integrated Departure Arrival Capability (IDAC)
- DEN Terminal Sequencing and Spacing (TSAS)
- Terminal Flight Data Manager (TFDM)

South West

- LAS Metroplex
- Update airspace/procedures infrastructure
- Extended Metering for LAX
 - Infrastructure
 - Dep Scheduling
 - Arrival Metering
- LAX TSAS
- TFDM

Operating Areas



Deconfliction across all operating areas and FAA projects

North East Corridor

- Extended Metering to PHL, EWR
 - ✓ Infrastructure (PHL)
 - Dep Scheduling
 - Arrival Metering
- Atlantic Coast Routes
- TFDM

Mid Atlantic

- Airspace/procedures infrastructure update
- Evaluate extended metering for ATL
- Extended Metering for ATL
 - ✓ Infrastructure
 - ✓ Dep Scheduling
 - Arrival Metering
- ✓ IDAC
- TFDM

TBO Maintains Basic Operational Roles, But Their Execution is Evolving

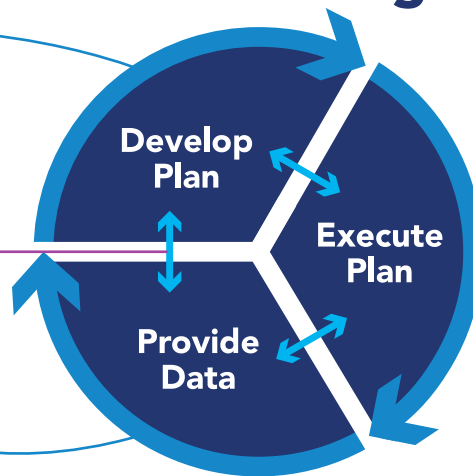
ATCSCC

Monitor and manage a safe, orderly, and efficient flow of air traffic

Multi-directional communications is critical

Operators

Collectively convey needs and allow the FAA to derive solutions

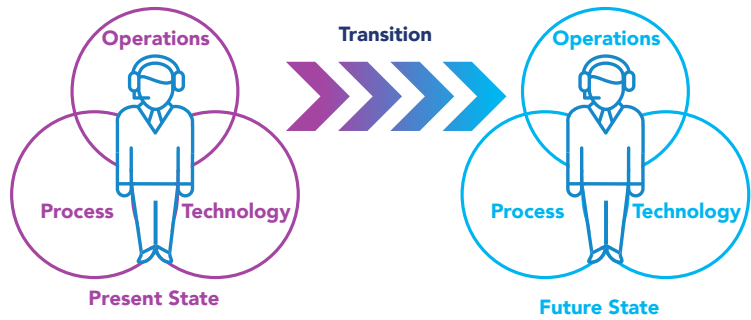


Facilities

Ensure safe, orderly and expeditious flow of air traffic

Change Strategy

Addressing the people component to achieve implementation success

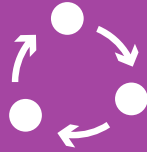


Leads

David Leopold

Jimmy Clouse

Chad Wakefield



Processes

Conducts change strategy activities

Identifies key operational change obstacles, develops mitigation strategies, and applies these strategies

Works closely with the FIT, is a key resource, and supports them to develop/implement their change strategy plans



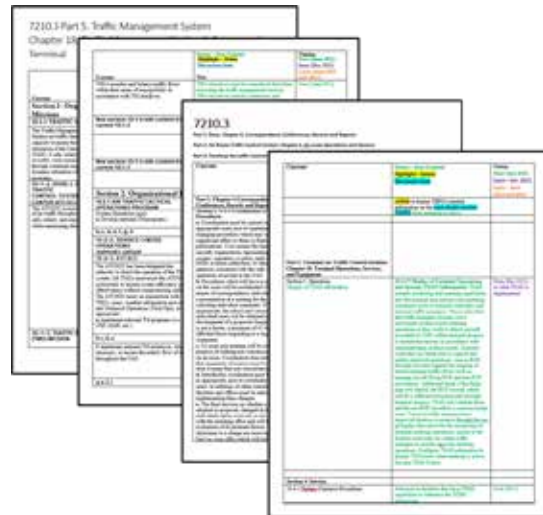
Coordinating Mechanisms

Meets bi-weekly or as needed with the TBO Support Team to exchange info, status activities, etc.

Meets with FITs on a regular basis to ensure support and communication is in place for change strategy

Bridging gaps in training and strengthening orders and procedures related to TBO

- **Coming Soon** – TBFM Fundamentals Briefing and DCP for 7210.3 to address needs identified by field facilities
- **Renewed focus** on creating national standards for TMC and controller training
- **Building the foundation** for TBO integration success



TBO Resources



PMO TBO KSN

<https://ksn2.faa.gov/ajm/pmo/TBO/SitePages/homepage.aspx>

Focus FAA Articles:

Across the Pond with TBO

https://my.faa.gov/focus/articles/2020/07/Across_the_Pond_with.html

Untangling the TBO Data Web

https://my.faa.gov/focus/articles/2020/07/Untangling_the_TBO_D.html

Global Go-Getter

https://my.faa.gov/focus/articles/2020/07/Global_Go_Getter_.html

FAA Completes Month-Long TBO Simulation Study

https://my.faa.gov/focus/articles/2020/07/FAA_Completes_Month_.html

Aviation's Future Unveiled at Tech Center's TITE

https://my.faa.gov/focus/articles/2020/03/Aviation___s_Future_.html

'Waze' Meets Air Traffic Control

https://my.faa.gov/focus/articles/2019/11/_Waze__Meets_Air_Tra.html

Intro to TBO: MITRE Video

[https://ksn2.faa.gov/ajm/pmo/TBO/VideoLib/video/TBO%20VIDEO%20SHORT%20\(2\)/TBO%20VIDEO%20SHORT%20\(2\).mp4](https://ksn2.faa.gov/ajm/pmo/TBO/VideoLib/video/TBO%20VIDEO%20SHORT%20(2)/TBO%20VIDEO%20SHORT%20(2).mp4)

TBFM Performance Summary

Monthly Performance Summary

https://tableau.faa.gov/#/site/_OPA/views/TBFMMonthlyPerformanceSummary/ContactUs?:iid=1

Daily Performance Summary

https://tableau.faa.gov/#/site/_OPA/views/TBFMDailyPerformanceSummary/ContactUs?:iid=1

POC: Rhonda Boles (rhonda.boles@faa.gov)

IAOO/PBN

ASPM, OPSNET, CountOps

<https://aspm.faa.gov/>

POC: ASPM Support (nasdi-support@volanno.com)

ATO Toolbox

https://tableau.faa.gov/t/_AJRGPerfAnalysis/views/ATOToolBox/Links?:embed=y&:tabs=n#1

MIT Stringency

POC: Aswin Gunnam (aswin.ctr.gunnam@faa.gov)

EDCT Compliance

POC: Moniss Mohanavel (moniss.ctr.mohanavel@faa.gov)

Arrival Fix Balancing

POC: Marcos Bolaños (marcos.bolanos@faa.gov)

Don't know where to start?

Alma Ramadani - almira.ramadani@faa.gov

Dave Raymond - david.raymond@faa.gov

Talking TBO Videos

Aaron Wilkins – April 2020

https://youtu.be/XIoG6vl_2ll

Arthur Orton - May 2019

<https://youtu.be/fKdlbkEWGBY>

Jeff Woods - Mar 2019

<https://youtu.be/rDScFqCP0OE>

Wendy O'Connor - Feb 2019

<https://youtu.be/8tahH2hN2t8>

Bob Mount - Nov 2018

<https://www.youtube.com/watch?v=4pldhiwnclo>

Kris Burnham and Rob Hunt - Oct 2018

<https://www.youtube.com/watch?v=IjqA7-q1UA8>

TBO facilitates strategic and collaborative approaches to managing demand-to-capacity imbalances in the National Airspace System, allowing for more predictable, efficient and flexible operations for its users.

To find out more contact
9-AJT-TBO@faa.gov

