

2022 REDAC Spring Meeting

Research on Operational Procedures

Presented to: REDAC E&E Subcommittee

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**Federal Aviation
Administration**



FAA Efforts Relating to Aircraft Operations

1. Investigation of operational opportunities for noise reduction:

- Airlines largely determine what aircraft fly and when
- There might be opportunities to change where aircraft fly (through precision navigation) and how aircraft are flown
- Must consider the entirety of the airspace and ensure the continued safety of operations
- Concepts being evaluated:
 - Route changes
 - Thrust / speed / configuration management
 - Vertical profile modifications
 - Systematic dispersion

2. Validation of noise abatement procedures

- Operationally validate (through flight sim/testing, noise measurement, etc.) noise management concepts

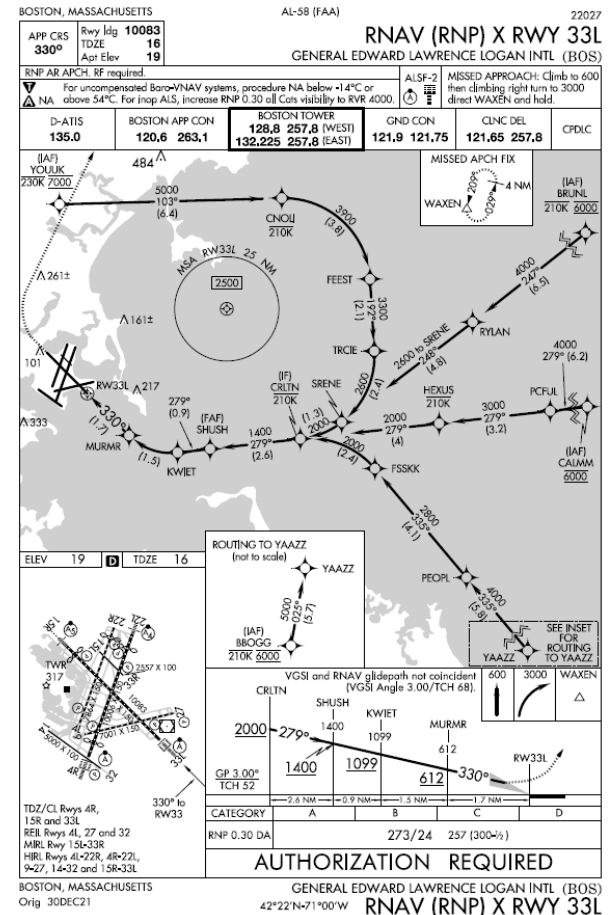
3. Advancement of tools, processes, and policies

- Execution of knowledge, guidance, & tools/options to manage noise
- Examination of metrics to facilitate assessment/communication of noise impacts



Massport MOU Update

- Signed in September 2016 – established framework for cooperation between Massport & FAA to explore operational changes to mitigate noise impacts
- Two Block 1 proposals published (33L arrival, 15R departure)
- Block 2 proposals voted on by Massport Community Advisory Committee (MCAC)
- Massport submitted official request to FAA in January 2022



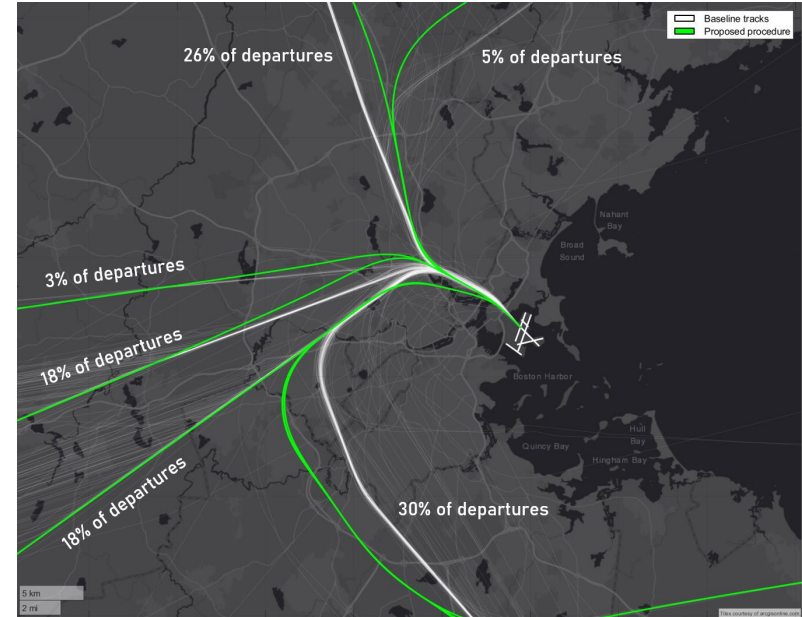
MCAC Motions (1 of 4)

- Motion 2-D1: Modify the current Runway 22L RNAV SID with a speed restriction to enable an earlier turn to the east, shifting aircraft tracks north away from the Town of Hull
 - Primary Benefits: Departure flight paths moved north away from the Town of Hull
- ✓ Passed. Submitted to FAA.



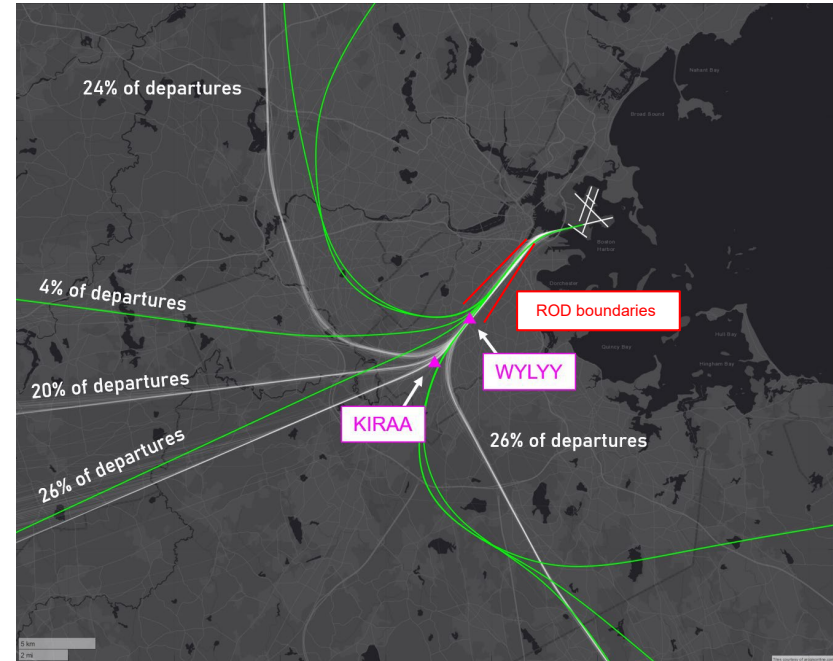
MCAC Motions (2 of 4)

- Motion 2-D2: Modify the current Runway 33L RNAV SIDs to enable the start of flight track dispersion at the earliest point possible (1 NM from the end of the runway)
- Primary Benefits: Increased dispersion of flight tracks and noise distribution
- ✗ Rejected
 - Does not de-concentrate flight paths or introduce variability



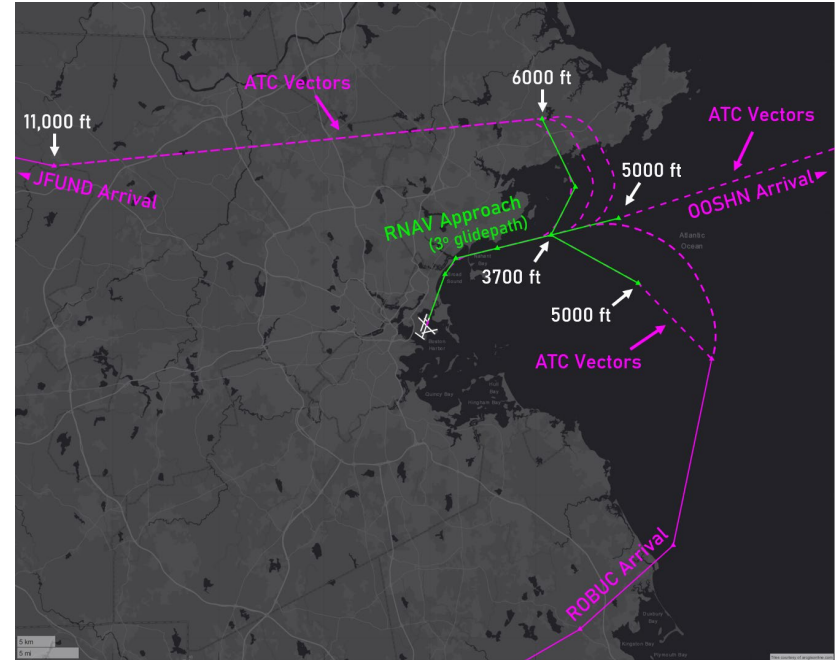
MCAC Motions (3 of 4)

- Motion 2-D3: Modify Runway 27 RNAV SIDs to begin flight track dispersion at the earliest point possible while satisfying the 1996 Environmental Record of Decision (ROD).
- Primary Benefits: Increased dispersion of flight tracks and noise distribution; lower net population noise exposure.)
- Some communities supported, while others did not
- Amended Motion 2-D3:
 - ROD is an outdated limitation
 - Massport, the FAA, and the City of Boston urged to agree to rescind the ROD and craft options that begin flight track dispersion at the earliest waypoint possible
- Pending. Under discussion by MCAC.



MCAC Motions (4 of 4)

- Motion 2-A1: Implement a new overwater RNAV approach for Runway 22L that crosses the Nahant Causeway from the east to join a 4-mile final approach
 - Primary Benefits: Arrival flight paths from the south and east moved overwater instead of overflying populated areas north/northeast of the airport
 - Amended Motion 2A-1:
 - MCAC requests an initial operational 12-month test
 - Massport to work closely with MIT and the FAA to collect appropriate data including noise measurements, noise complaints, weather, runway use, and radar flight tracks
- ✓ Passed. Submitted to FAA.

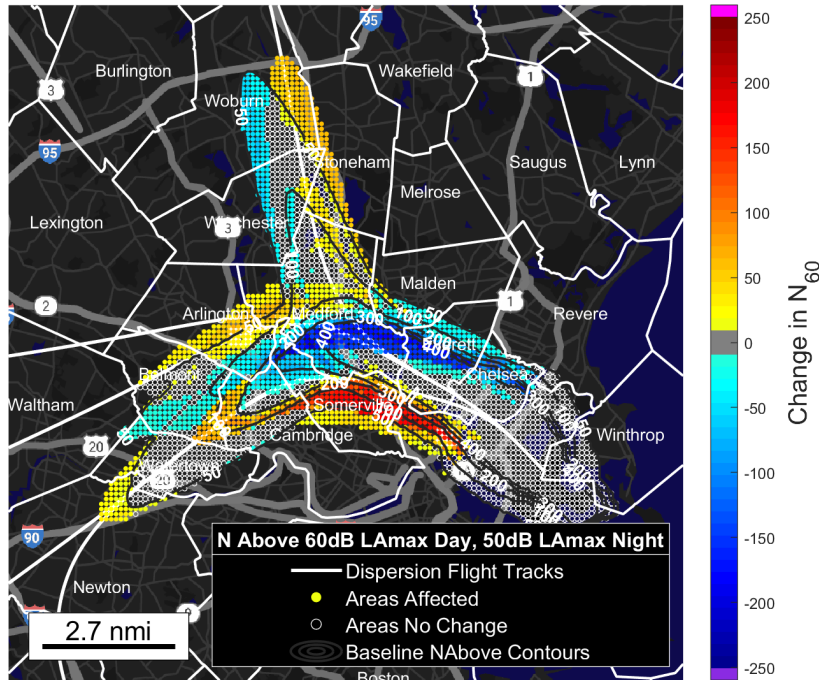


Next Steps

- **FAA will follow normal process to evaluate/implement proposals**
- **Achieved goals of MOU (case study); FAA-Massport-MCAC coordination will continue**
- **Planning FAA-MIT-Massport workshop to discuss the overall outcomes and lessons learned from the effort**



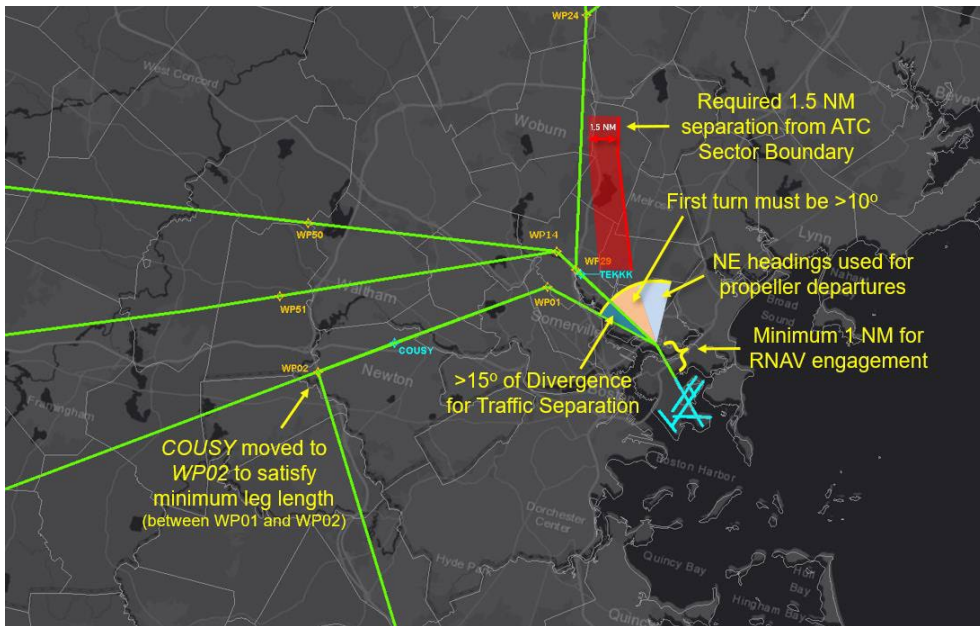
Lessons Learned – Data Visualization



- Effectiveness of N₆₀ metric
- Interest in aggregate visualization vs. single flight
- Interest in expected altitudes and usage time/frequency
- Community-level impacts



Lessons Learned – Procedure Constraints



- **Design criteria**
 - Necessity of TARGETS
 - Opening up a procedure for modification can trigger criteria failures outside of noise impact area
- **ATC considerations**
 - Separation/sectorization impacts
 - Letter of Agreement impacts; en route automation
 - Controller training and workload
- **Operator considerations**
 - Flyability
 - Adherence to Standard Operation Procedures

ASCENT-44 (Noise Abatement Procedure Modeling/Validation) Update

Primary Objectives:

- Collect aircraft state and noise measurement data to support validation of noise modeling methodology and identification of low-noise behaviors
- Gain stakeholder perspectives on flyability and implementation barriers to low-noise procedures

Current Status:

- Arrival analysis at BOS and SEA indicated noise reduction potential for delayed deceleration approach procedures
- Analyzing aggregate departure noise and flight procedures so statistically significant factors that correlate with measured noise can be identified



Summary – Direction of Work

- **ASCENT-23:**

- Finalize lessons learned from Massport MOU—including constraints and applicability to NAS
- Focus on implementation opportunities/considerations for quieter procedures, specifically how existing/new ATM systems can enable integration of more noise- (and likely also fuel-) efficient profiles.

- **ASCENT-44:**

- Expand noise data analysis (noise monitor and surveillance data), examining the tails (loudest/quietest) in distribution and identifying contributing factors.
- Expand to other airports/datasets as needed to identify trends and/or local variances.





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