2020 REDAC Fall Meeting

Aircraft Operations for Reduced Noise

By:Chris DorbianDate:September 17, 2020





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 <u>where</u> aircraft fly (through precision navigation) and <u>how</u> 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



FAA-Massport MOU

- Memorandum of Understanding signed in September 2016 established framework for cooperation between Massport & FAA to explore operational changes to mitigate noise impacts
- MIT developed noise evaluation framework (through ASCENT-23) and is applying it (through Massport funding) to BOS to build and assess procedures
- FAA and industry are providing feedback on the operational feasibility of these ideas
- MIT ideas separated into two blocks:
 - Block 1: Clear noise benefit, no equity issues, limited operational/technical barriers
 - Block 2: More complex due to potential operational/technical barriers or equity issues

LL-29632

MEMORANDUM OF UNDERSTANDING

BETWEEN THE

FEDERAL AVIATION ADMINISTRATION

AND THE

MASSACHUSETTS PORT AUTHORITY

1. Parties

The parties to this Memorandum of Understanding ("MOU") are the Federal Aviation Administration ("FAA") and the Massachusetts Port Authority (the "Authority").

2. Purpose

This MOU outlines the actions the Authority and the FAA intend to undertake in seeking reductions to overflight noise impacts of aircraft operations at Boston Logan International



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December 20, 2017

Ms. Amy Corbett Regional Administrator Federal Aviation Administration New England Region 1200 District Avenue Burlington, MA 01803-5299

RE: FAA\MPA RNAV MOU Block 1 Ideas: Request for FAA Review and Implementation for Boston Logan International Airport

Dear Ms. Corbett: Amy

I am writing to request that the Federal Aviation Administration (FAA) review and implement the Block 1 procedure recommendations by the Massachusetts Institute of Technology (MIT) study team as a result of the Memorandum of Understanding (MOU) between the FAA and the



Block 1 Update

- Proposed RWY 33L arrival required a waiver, which was denied
- Initial RWY 15R departure proposal required a waiver due to FAA criteria changes
- FAA has redesigned both concepts and presented to Massport / MCAC for acceptance
- FAA still awaiting go-ahead from Massport / MCAC







Block 2 Update

- Objective: Increase equity by dispersing flight tracks off RWY 33L (requested by communities)
- Block 2 options evaluated:
 - Altitude-based dispersion
 - Direct routing to transition waypoint upon reaching specific altitude
 - Controller-based dispersion (LOGAN TWO)
 - Dispersion arising from radar vectoring
 - Divergent heading dispersion
 - 15 deg divergent headings then direct routing to transition waypoint
 - RNAV Waypoint Relocation
 - Moving the waypoint at which the RNAV tracks branch off could allow for population exposure reduction
 - Variable Rotation Departure (VRD) (Community Proposed)
 - Varying departure path on some scheduled frequency





FAA/Industry Block 2 Feasibility Assessment

- FAA agreed to provide an early feasibility assessment of Block 2 options
 - Assembled input from airline industry, the FAA Air Traffic Organization (Mission Support Services, Air Traffic Services, System Operations and the National Air Traffic Controllers Association), the FAA Office of Environment and Energy, and FAA Flight Standards
- All proposals determined to be "Not a Candidate for Further Evaluation"
- Feedback was concept-specific, but also included overarching considerations:
 - BOS airspace is complex and highly interdependent; current procedures optimized for safety and efficiency, taking into account runway layout, weather, geography, etc.
 - Flight Track and Altitude Predictability
 - Frequency of Pilot and Controller Transmission
 - Presence of Acceptable Levels of Safety (for criteria deviations)



Reauth. Sec 179 Report Overview

Airport Noise Mitigation and Safety Study

"Not later than 1 year after enactment, the FAA shall initiate a study to review and evaluate existing studies and analyses of the relationship between jet aircraft approach and takeoff speeds and corresponding noise impacts on communities surrounding airports"

Primary conclusions:

- 1. Changes in aircraft climb speed do not have an appreciable impact on the overall aircraft departure noise due to the dominance of engine noise.
- 2. On arrival, delaying the deceleration of the aircraft could have a noticeable noise impact (reductions in the range of 4 to 8 dBA for certain locations).
- 3. Additional work is required to validate this potential noise benefit and resolve implementation challenges.



Ongoing Work

- Primary Objectives:
 - Collect aircraft state and noise measurement data to support validation/identification of low-noise behaviors
 - Gain stakeholder perspectives on flyability and implementation barriers to low-noise procedures
- Held multiple meetings with Airlines for America
 - Follow-up with individual airlines ongoing
- Technical Exchange Meeting with the German Aerospace Center (DLR)
- Revisiting in hand MIT noise and flight data
- ASCENT-53: Open-source data collection, analysis and mitigation of aviation environmental impacts (Year 2)
 - Continued maturation of Stanford Metroplex Overflight Noise Analysis (MONA) prototype, including data visualization and correlation of observed noise with aircraft state. Conceptual opportunities for air traffic procedures in the SF Bay Area will also be considered.
 - AEE organizing a training w/MITRE (for both Stanford and MIT) on PBN procedure design / TARGETS





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