

# **ASCENT Project 23: Analytical Approach for Quantifying Noise from Advanced Operational Procedures**



Acknowledgement to: Chris Dorbian, Joe Dipardo, and Bill He (FAA); Luke Jensen, Jacqueline Thomas, Greg O'Neill, Alison Yu, Clement Li, Cal Brooks, Morrisa Brenner, and Sandro Salguiero (MIT); Flavio Leo and Frank lacovino (Massport); Brad Nicholas, Mary Ellen Eagan, and Bob Mentzer (HMMH)

# **PBN-Enabled Advanced Operational** Lateral Modification of PBN **Procedures at Boston Logan Airport Procedures** Noise-driven PBN Boston Logan Airport is analyzed as a case study based on procedure design has the a Memorandum of Understanding between the FAA and potential to reduce Massport population noise exposure Noise Complaints and Flight Tracks at BOS Analyzing a variety of **Before and After Advanced Operational Procedures** candidate RNAV and RNP procedure concepts at Boston Logan Airport to address community noise concerns Noise impact assessed Example low-noise overwater RNAV instrume using Project 23 analytical approach procedure to Runway 33L at BOS with approach and toolset LAMAX noise contours **Reduced Speed Departures Stakeholder Outreach** • Application of physics-based framework reveals overall Stakeholder outreach includes: noise reduction through reduced speeds on departure Community input due to reduced aerodynamic noise Massachusetts Port Authority Estimates of noise impacts of reduced speed departures FAA Office of Environment and Energy being refined. Validation will be pursued under ASCENT-44. FAA Regional Office FAA Order 7100.41 Full PBN Working Group -Initial climb spee Political representatives Air Traffic Control Tower and TRACON Airline operators and Airlines 4 America cceleration height - Petract flans on schedule • Rotate FAA .41 Stakeholder Working Analysis Input Outreach Positive rate of clim! Group Limit climb speed on RNAV SID departures to reduce airframe noise contribution (i.e. 220 Knots through 10,000') **Block 1 Recommendations** B737-800 Reduced Speed Departure L<sub>A,MAX</sub> L<sub>A.MAX</sub> (dB) Contours for B737-800 Clear noise benefit, no equity issues, limited operational/ (dB) Contours on 33L Departure at BOS Departure with Different Climb Speeds technical barriers endations published December 2017 and Boeing 737-800 Departure LAMAX (dB) Contours eview by the FAA .41 Working Group Flight Directio nk: http://hdl.handle.net/1721.1/114038 **Primary Benefits** Engine Noise Dominates d for jet departures from Runways 33L Reduced airframe and total imum safe airspeed in clean noise during climb below 10,000 ft (beyond immediate airport vicinity Newton Brookline unway 15R to move tracks further to the Departure flight paths moved north away from Hull 0 2 4 ed areas Airframe and Engine Noise Balance inway 22L and 22R to initiate turns Departure flight paths moved Flight Tracks & LAMAX Noise Contours (dB ove tracks further to the north away north away from Hull and -1 nm Spacing Marker South Boston -Baseline Flight Track Baseline B738 Contours ept course (VI-CF) procedure Alternate Flight Track then direct (VA-DF) procedure 220 knots B738 Contour procedure NAV approach procedure with RNP Arrival flight paths moved Flight Direction t follows the ground track of the jetBlue overwater instead of over the closely as possible Hull peninsula and points Airframe Noise Dominates further south ment approach procedure on of RNAV Visual procedure



 HMMH Consulting Community

Block 1 Recomme currently under re Block 1 Report Lin	
Proc. ID D = Dep. A = Arr.	Procedure
1-D1	Restrict target climb spee and 27 to 220 knots or mi configuration, whichever i
1-D2	Modify RNAV SID from Ri north away from populate
1-D3	Modify RNAV SID from Ri sooner after takeoff and n from populated areas.
1-D3a	Option A: Climb to interce
1-D3b	Option B: Climb to altitude
1-D3c	Option C: Heading-based
1-A1	Implement an overwater F overlay to Runway 33L th RNAV Visual procedure a
1-A1a	Option A: Published instru
1-A1b	Option B: Public distribution

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