Wyle’s Role in the Analysis of Potential Procedures to Reduce Departure Noise at Madrid Barajas Airport

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Overview

• Objectives
• Study Methodology
• Study Approach
• Tools & Procedures
• Conclusions
Objectives

- Optimize flight tracks to North and South of MAD to minimize noise impact on population
- Analyze additional noise abatement alternatives (i.e., traffic distribution, nighttime restrictions)
- Coordinate with MITRE and FAA to determine operational feasibility of alternative noise abatement procedures
FSAM Study Methodology (1)

- Noise Metric:
  Identical to Day-Night Average Sound Level (DNL) except that LAeq is averaged over 16 hours for Day and 8 hours for Night.
  - LAeq_{DAY}: 0700 to 2300 local time. Threshold = 65 dB.
  - LAeq_{Night}: 2300 to 0700 local time. No 10-dB Night Penalty. Threshold = 55 dB.
FSAM Study Methodology (2)

• Runway Utilization:
  – 100-percent North flow configuration
  – 100-percent South flow configuration

  – Actual Traffic Distribution: 93%-North, 7% South
Study Approach (1)

• Collect and review operational data based on forecast CY2025 operations data
• Convert and integrate data into INM
  – Operations data
  – Population Data
  – Terrain data
• Noise impact for Baseline CY2025 conditions
• Flight track optimization
Study Approach (2)

• Validation of optimized flight tracks
• Analysis of other noise abatement alternatives
• Comparison of baseline and alternative noise impacts
Tools Used

- Integrated Noise Model 5.2a
- Wyle’s Aircraft Noise Community Impact Model (ACNIM)
- Advanced Wyle aircraft equivalency algorithms
- Several Wyle conversion utilities for Terrain and population data
- GIS
Conclusions

• Flight Track Analysis
  – Biggest noise impact contributor being south-flow departures (~7% of total annual operations)
  – In the North-flow configuration, biggest noise impact contributor being arrivals from the south
  – Non-Standard Procedures with decreased divergence can result in noise benefits
Conclusions

• Aircraft Mix Analysis
  – Redistribution of traffic of minimum noise benefit in comparison to baseline conditions

• Nighttime Traffic Analysis
  – Runway restrictions show a tremendous noise benefit (~90-percent impact reduction) during nighttime (2300-0700 local time) operations in the south-flow configuration.
QUESTIONS??