Subgroup 3 (Human Response and Metrics) Briefing, Fall 2023

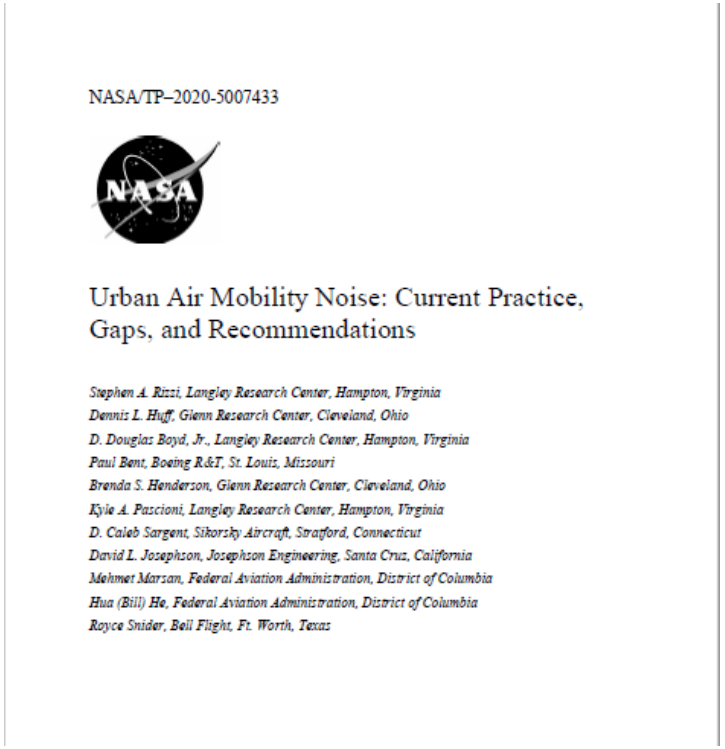
Siddhartha Krishnamurthy (NASA), Yahia Ismail (Supernal)

UAM Noise Working Group Meeting

November 2, 2023

UAM Vehicle Noise Human Response Study

- UNWG white paper recommended human response study to understand community variation in noise perception
- Study Goals:
  - Assemble a wide range of UAM vehicle sounds for use in human response studies.
  - Create a rich human response database
  - Provide insights into human response to UAM vehicle noise
- Two Phases:
  - Feasibility Test (completed)
  - Implementation Phase on UAM noise human response (current focus)
- NASA decided to develop and utilize a remote psychoacoustic testing capability for this study



NASA/TP–2020-5007433

Urban Air Mobility Noise: Current Practice, Gaps, and Recommendations

Stephen A. Rizzi, Langley Research Center, Hampton, Virginia
Dennis L. Huff, Glenn Research Center, Cleveland, Ohio
D. Douglas Boyd, Jr., Langley Research Center, Hampton, Virginia
Paul Bent, Boeing R&T, St. Louis, Missouri
Brenda S. Henderson, Glenn Research Center, Cleveland, Ohio
Kyle A. Pascioni, Langley Research Center, Hampton, Virginia
D. Caleb Sargent, Sikorsky Aircraft, Stratford, Connecticut
David L. Josephson, Josephson Engineering, Santa Cruz, California
Mehmet Marsan, Federal Aviation Administration, District of Columbia
Hua (Bill) He, Federal Aviation Administration, District of Columbia
Royce Snider, Bell Flight, Ft. Worth, Texas

[1]S. A. Rizzi, D. L. Huff, D. D. Boyd, Jr., P. Bent, B. S. Henderson, K. A. Pascioni, D. C. Sargent, D. L. Josephson, M. Marsan, H. He and R. Snider, "Urban Air Mobility Noise: Current Practice, Gaps, and Recommendations," *NASA/TP–2020-5007433,* October 2020.

Implementation Phase Test Research Goals

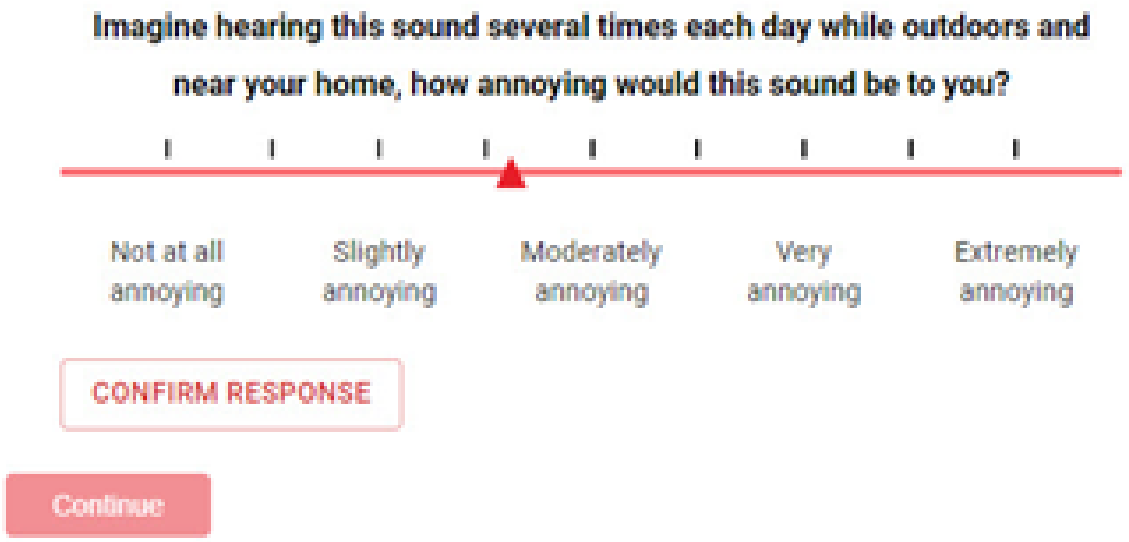
Implementation Phase test has been renamed: Varied Advanced air mobility (AAM) Noise and Geographic Response Difference (VANGARD) test

- Research Question 1: Are there statistically different annoyance responses for different anonymous AAM aircraft sounds and their given takeoff and landing (and level cruise if available) operations based on qualitative or quantitative aspects of those sounds?

- Research Question 2: Are there statistically different annoyance responses between different groups of test subjects, where the groups are defined by situational factors that could potentially affect noise response?

VANGARD Test Questions

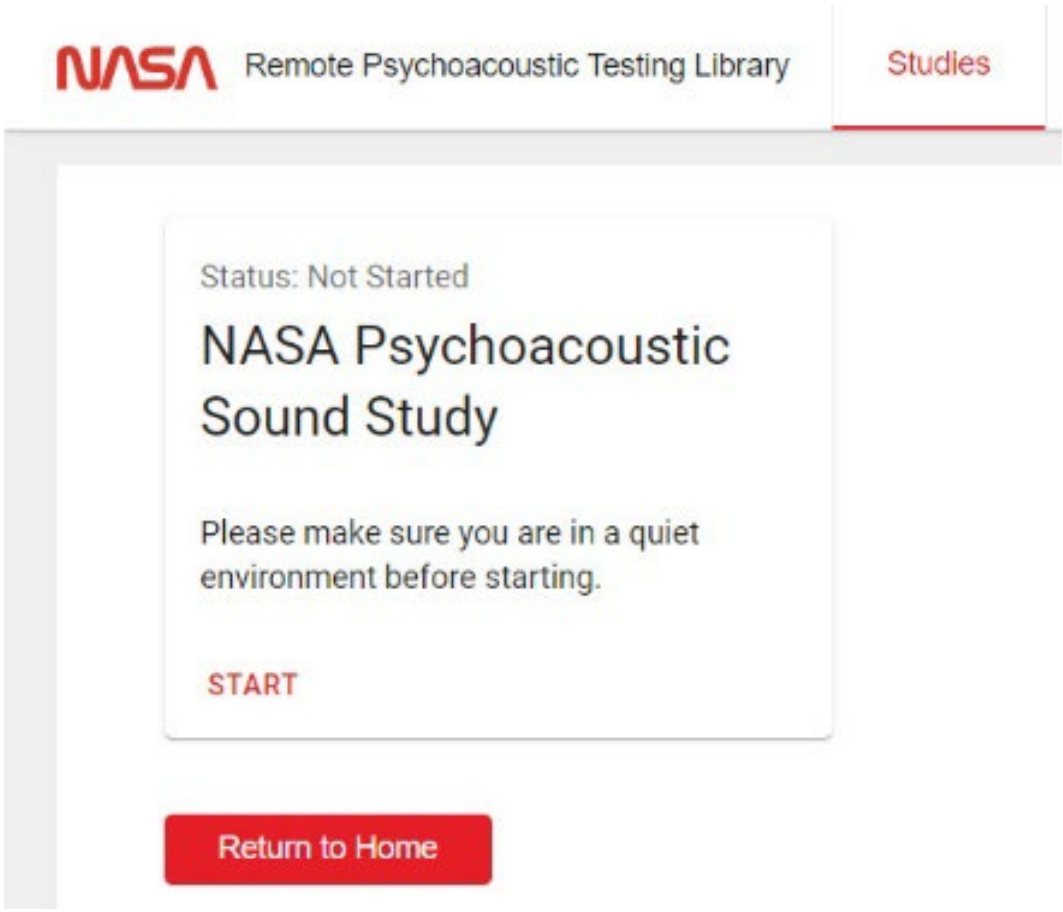
- Each test question will be recorded or auralized sound of an AAM vehicle in flight played with relatively low ambient noise.



- Number of Test Questions Per Test Subject × Average Duration of Test Sounds ≤ 30 minutes

Remote Psychoacoustic Test Platform Updates

- Kiosk mode
- Ability to restart test from last exit
- Mixing test stimuli with continuous ambient noise
- Multiple practice test questions



VANGARD Test Status

- Test is planned for July – September 2024
- Stimuli currently being gathered
- NASA Contract for test administration being procured
- Updating NASA Remote Psychoacoustic Test application to use different login method

Sound Quality Analysis Toolbox (SQAT)

- At the SG3 Sep 27 meeting, Dr. Roberto Merino-Martinez from TU Delft presented on Sound Quality Analysis Toolbox (SQAT).
- Slides from Roberto's talk can be found here: https://surfdrive.surf.nl/files/index.php/s/62UjuXPDMr8vNfj.
- SQAT can be accessed here: https://github.com/ggrecow/SQAT.
- A paper on SQAT can be found here: https://appfa2023.silsystem.solutions/atti/000600.pdf.
- If you have questions on SQAT, please email Roberto at r.merinomartinez@tudelft.nl.

Questions?

Image References

- All images in this presentation are generated by presenter.