

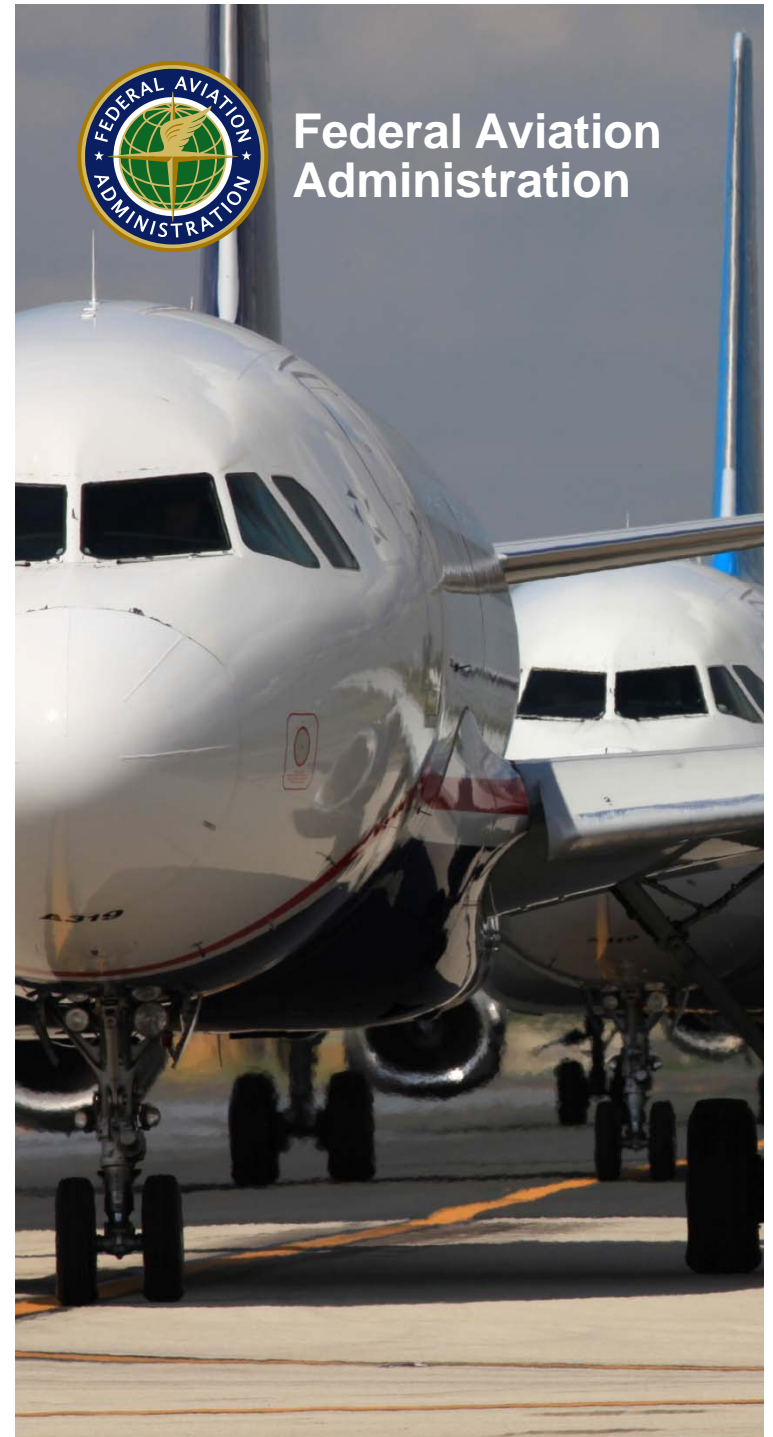
Noise

Program Update and Noise Survey Update

Presented to: E&E REDAC

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Important Drivers of Research

Even though the number of people in the U.S. exposed to significant aircraft noise since 1975 has dropped by 95 percent, complaints, opposition and challenges regarding aviation noise have not

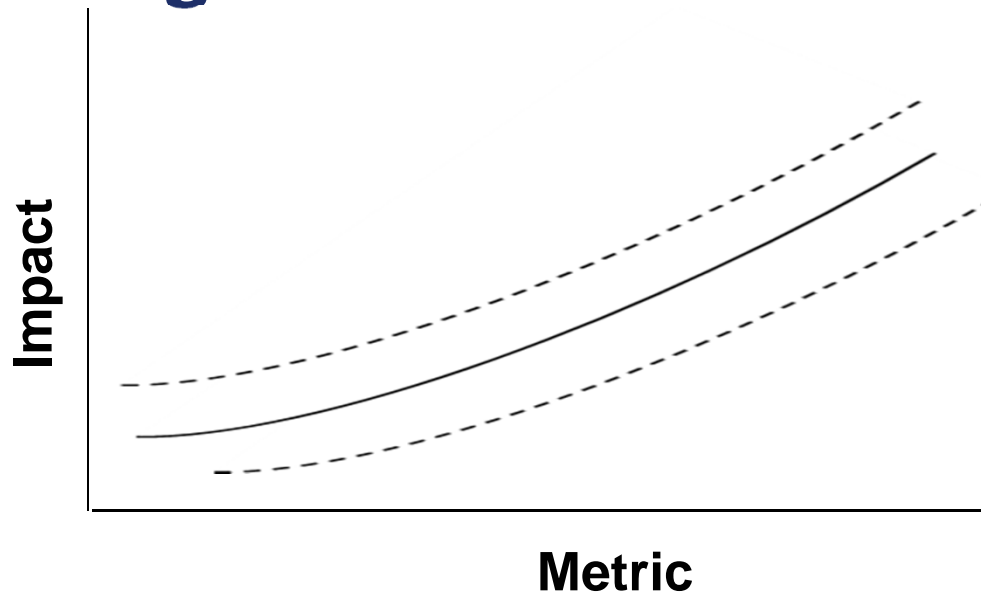
- **Goals**

- Community noise concerns are not a significant constraint on growth
- Reduce the U.S. population exposed to significant aircraft noise around airports
 - By 2018, have the U.S. population exposed to significant aircraft noise around airports have been reduced to less than 300,000 persons



Updating FAA Noise Research Roadmap

Overarching Goal



Timeframe	Metric	Impact	Work
Current	DNL	% Highly Annoyed	
Mid-Term	DNL	% Highly Annoyed	ACRP 02-35 and Aircraft Noise and Annoyance Study
Far-Term	?	?	Additional Research

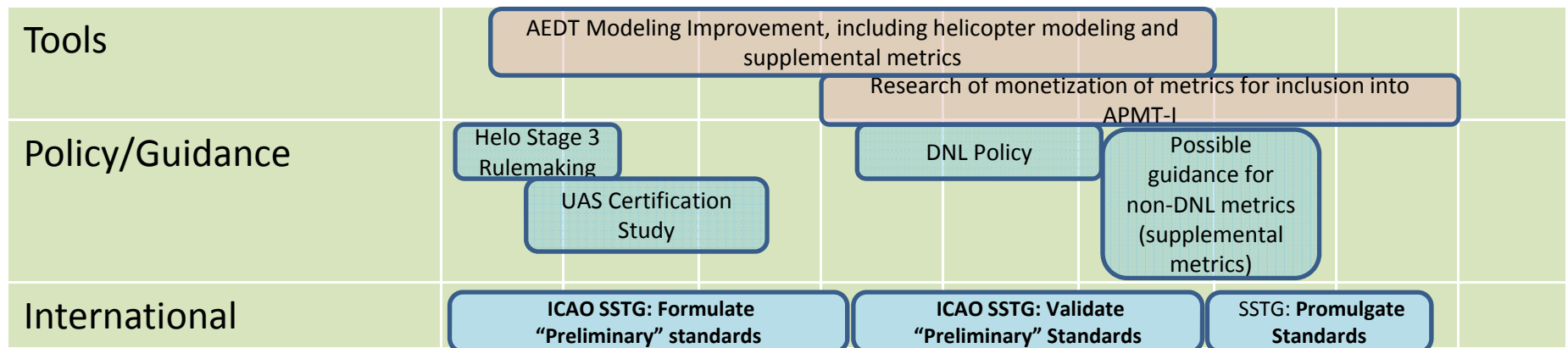
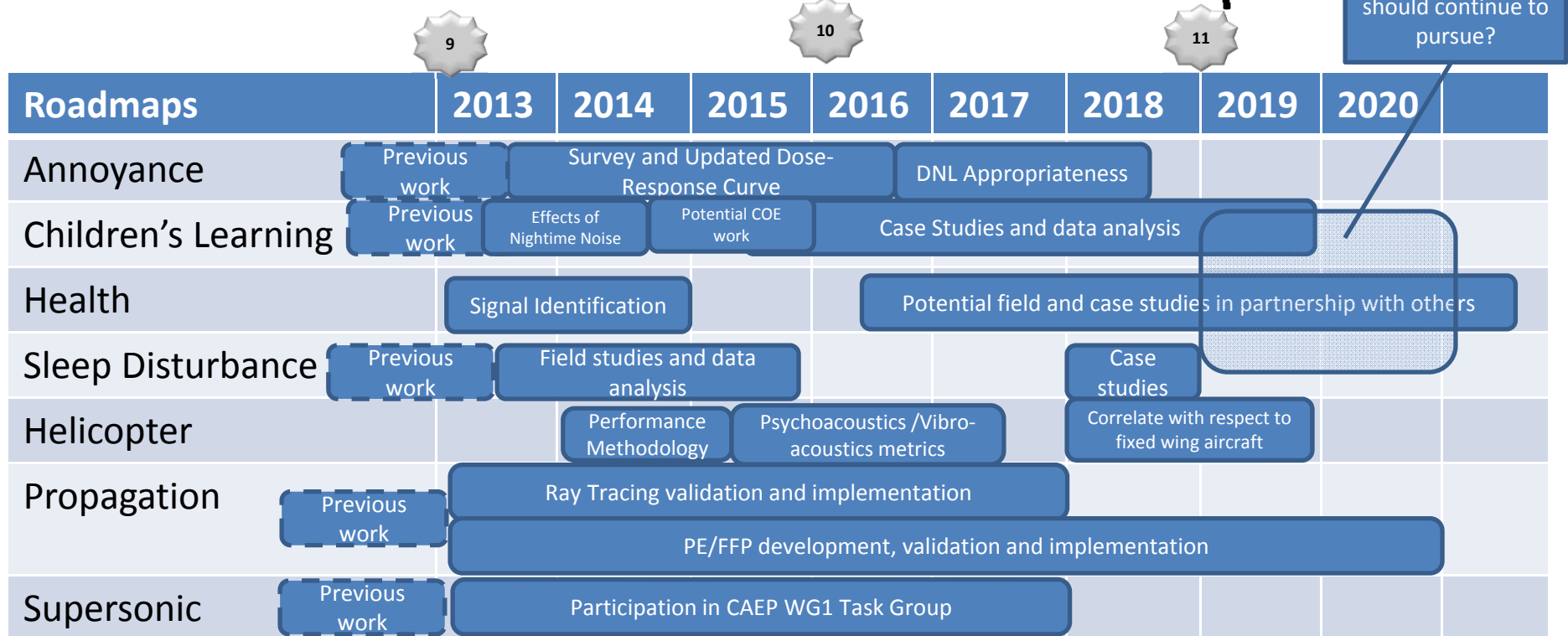


Research Questions

- What is the correct threshold for significance and/or Land Use Planning with respect to DNL?
- Should FAA be considering an alternative/supplementary metric to DNL?
- For different health/welfare impacts, what are the indicators of noise impacts and are they significant? Are different metrics needed for different impacts?
- What improvements can be made to noise modeling? What, if anything, needs to be developed to account for new aircraft types such as open rotor and/or supersonic over land?
- What is needed from a standard to consider allowing supersonic flights over land?
- What is needed to improve helicopter noise understanding? Can we correlate people's reaction to fixed wing noise to reaction to helicopter noise?



Noise Research Roadmap



Note: Recognizing the unique concerns of aviation noise on National Parks have been requested and the best way to address the need is being considered.

FAA Noise Research Roadmap Updates

- **Seeking Stakeholder Feedback**
 - REDAC
 - PARTNER Center of Excellence
 - ACI-NA Noise Committee
 - ICAO CAEP
 - UC Davis Noise and Air Quality Symposium
- **Used to streamline FY14 planning**
- **Implementing REDAC suggestions**
 - Not yet complete



Overall Noise Division Needs

- **Source – A, ME, MO**
 - Subsonic Aircraft
 - Supersonic Aircraft
 - Helicopter/Tiltrotor
 - Unmanned Aircraft Systems
 - Launch Vehicles
 - Future configurations
- **Propagation – A, ME, MO**
 - 0 to 10,000 feet
 - 10,000 feet to 30,000 feet
 - Above 30,000 feet
- **Certification – A, MO**
- **Structural Transmission – A, ME, MO**
- **Rulemaking - A**
- **Land Use Planning - A**
- **Dose and Metric – A, ME, MO**
 - Health
 - Children's learning
 - Sleep
 - Impact on Wildlife
 - Community Annoyance
 - National Park annoyance
 - National Park audibility
 - Sonic boom
 - Low Frequency Noise

A – Analysis ME – Measurement

MO – Modeling Methods



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Noise Research Overview

CONTINUED ADVANCEMENTS

Noise
Certification

Measurement
Standards

EMERGING AREAS

Unmanned
Aircraft Vehicles

Launch Noise

ACTIVE AREAS OF RESEARCH

Helicopter
Noise

Supersonic
Aircraft

Noise Source
and Propagation

Noise in Quiet
Areas

IMPACTS

Annoyance –
DNL and Beyond

Children's
Learning

Health
Impact

Sleep
Disturbance



Areas that have Needed Additional Focus in the last 6 Months

- **Helicopter Noise**
 - Los Angeles and New York mostly
- **Grand Canyon (GRCA) Quiet Technology Incentives**
 - Implementing MAP-21 language in collaboration with National Park Service
- **Noise Survey**
- **UAS Certification**
 - Question of how small, light-weight UAS should be treated under Part 36
- **Growing Interest in Noise**
 - More media, congressional, and public interest in noise
 - ombudsman is busier, additional congressional letters, and more news stories



FY14 Work Area for Noise Division (including ACRP) – 1 of 2

- **Impacts**
 - Children's Learning
 - Health
 - Sleep Disturbance
- **Rotorcraft noise abatement operating conditions modeling**
- **Civil, supersonic over flight, sonic boom (noise) standards development**
- **Maintain and update NoiseQuest**
- **Continued research on Noise Level Reduction**
- **Stage 5 Rulemaking**



FY14 Work Area for Noise Division (including ACRP) – 2 of 2

- **Noise Survey**
- **Helicopter Noise Survey (through ACRP)**
- **Analysis of Impacts of Noise Focusing**
- **Modeling Improvements**
 - ACRP 02-55:Enhanced AEDT Modeling of Aircraft Arrival and Departure Profiles
 - ACRP 02-52: Improving AEDT Noise Modeling of Hard, Soft, and Mixed Ground Surfaces
 - ACRP 02-51:Evaluating Methods for Determining Interior Noise Levels Used in Airport Sound Insulation Programs
 - Ray Tracing Sound Propagation Methodology
 - Helicopter Performance Modeling Improvement



AIRPORT NOISE SURVEY



Federal Aviation
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FAA State of the Practice

- **Day-Night Average Sound Level (DNL) 65 decibels (dB)**
 - Threshold below which all *land uses are deemed compatible*, unless community and airport adopt a lower local standard;
 - Value FAA uses to define significant noise under agency noise exposure goals;
 - Area in which a proposed action would be considered a significant impact under National Environmental Policy Act (NEPA) if it resulted in an increase of DNL 1.5 dB or more; and
 - Initial screening criteria for eligibility for noise mitigation funding.

Even though DNL 65 dB contours have decreased significantly over last 30 years, opposition and challenges regarding aircraft noise have not



Background on DNL 65 dB

- In 1979, through the Aviation Safety and Noise Abatement Act (ASNA) of 1979, FAA implemented the ASNA's provisions in Part 150. This regulation adopted the DNL metric and the 65 dB land use compatibility guideline
- 1992 – last in-depth review reaffirmed 1979 decision
- Core Question:
 - Has there been a significant change in public perception for noise?



Shrinking of many DNL 65 dB contours

- **Significant reductions in many contours (but not all):**
 - Approximately 7 million people in 1975
 - Approximately 321,000 today
- **Continued reduction in some places due to:**
 - Continued transition to newer, quieter aircraft
 - Continued airport noise mitigation programs, including noise abatement procedures where appropriate
 - Slower growth in operations at some airports due to larger aircraft
- **Part 150 helping to reduce incompatible land uses for participating airports**
- **Yet, still face significant opposition and controversy due to noise-related issues**



National Survey

- To conduct a new nation-wide survey to update the scientific evidence of the relationship between aircraft noise exposure and its effects on communities around airports
- FAA supported an ACRP Project which was designed to look at research methods for a national survey and validate the methods at three airports
- National survey will be completed at 20 airports, which represent all airports in the nation based on statistical approach
 - Four critical airports identified to be included due to number of people exposed to aviation noise around those airports and the number of operations at those airports



Accomplishments

- **FICAN has approved the Airport Selection Criteria**
- **Draft talking points and letters have been prepared and are being finalized**
- **Close to determining the number of people who needs to be surveyed in each noise band**
 - Both phone and mail estimates
- **Questionnaire is finalized**



Survey Details

- **Questionnaire**
 - Developed by internationally recognized experts in annoyance questionnaire development and reviewed by expert panel
- **Survey Method**
 - Survey from DNL 50 – 70 dB
 - Completing both Phone and Mail surveys
- **Data Analysis**
 - Create dose-response curve (DNL vs Annoyance)



Schedule

- ACRP project Research Methods for Understanding Aircraft Noise Annoyance and Sleep Disturbance scheduled to be completed by April 2014
- Aircraft Noise and Annoyance Survey Project
 - Finalizing the Questionnaire (March 2014)
 - Finalize OMB Submittal (March 2014)
 - Needs to go through FAA and DOT review and Federal Register Notice before it can be submitted to OMB
 - Brief DOT Office of the Secretary (April 2014)



Discussion

- **Aviation Noise is getting a lot of attention**
 - Areas we didn't foresee as such a high priority are being prioritized higher due to circumstances
- **Many noise projects are being undertaken this year**
 - Provides resource challenges
- **FAA Research Roadmap provides clear direction of where AEE plans to take aviation noise research**
 - Roadmap will be updated periodically to reflect changing priorities, funding picture, and needs

